Mental tension and its cure

Dr. O. P. Jaggi
M.D., Ph.D., F.C.C.P. (USA) F.A.C.A. (USA)

A little pocket Bible on stress and strain.
It tells us what not to do without hurting our ego.

Mental Tension and Its Cure

Mental tension, in its various forms, is a major problem of the times we live in. Latest studies indicate that a large percentage of human beings living in cities suffer from it in some kind or the other. They may even be insane, in various degrees. Once taken up by a problem, the sufferer starts going down. Fatigue, irritability, exhaustion, insomnia, ulcers, high blood pressure, heart trouble, etc., are a few accursed companions of mental tension.

This book discusses mental tension in all its aspects, its causes, effects, prevention and cure. It is based on the results of the latest researches and the professional experience of the author over the years.

The author, Dr. O.P. Jaggi, has not only a large number of books on medical subjects to his credit, which include an encyclopaedia in several volumes, his over half-a-dozen works aimed at the layreader on these subjects have also been immensely popular.

He is a renowned physician, medical scientist and scholar. During his professional life extending well over 30 years, he has travelled extensively and studied diseases under different environments. Lately, he was the Senior Consultant Physician in Nigeria. He is the Dean, Faculty of Medical Sciences, University of Delhi, and President of the Foundation for Total Health Care.

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Dr. O.P. Jaggi
M.B.B.S., M.D., Ph.D.
F.C.C.P (USA), F.A.C.A. (USA)
F.R.A.S. (London)

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PREFACE

Stress and tension is an uncalled for response of the body. It serves no useful purpose of the individual who is under stress; on the other hand, it makes him less efficient, less effective and more quarrelsome.

If the tension is prolonged, it can cause many diseases: high blood pressure, susceptibility to heart attack and stomach ulcers.

How to avoid mental tension in our surroundings which easily generate sparks and conflagrations, is the need not only of you and me, but of the whole society.

This book describes the results of the latest scientific researches on stress and tension: what precisely it is how the human body fights it; what diseases occur when the body succumbs to it; different stress situations in our day-to-day living, and most importantly, how to avoid stress and how to lessen it.

This last aspect of mental tension has been discussed in great detail so that everyone can pick and choose the methods most suitable to his temperament.

It is hoped that this revised and enlarged edition of the book will prove more useful. It also incorporates answers to innumerable queries that I received since the publication of the first edition.

V. Patel Chest Institute
University of Delhi

O.P. Jaggi.

CONTENTS

	Preface	5
1.	What is Stress	9
2.	How does the Body Fight Stress	13
3.	Factors that Produce Stress and Tension	19
4.	Stomach Ulcers and Tension	25
5.	Mental Tension and High Blood Pressure	30
6.	Mental Stress and Heart	40
7.	Mental Tension and Sleep	50
8.	Headache and Mental Tension	56
9.	Fatigue, Exhaustion and Mental Tension	60
10.	Family Conflicts and Tension	63
11.	The Event of Bereavement	68
12.	Children and Mental Tension	74
13.	Tension in Middle-Aged Female	80
14.	Tension in Middle-Aged Male	84
15.	Aging without Tension	87
16.	Retirement Disease	94
17.	Your Job and Mental Tension	97
18.	Noise and Tension	101
19.	Role of Inferiority Complex	105
20.	Neighbours and Mental Tension	109
21.	Slow Down, Please	114
22.	Physical Exercise and Mental Tension	119
23.	Muscles and the Mind	124
24.	Yogic Method of Relaxation	128

25. Meditation for Lessening Mental Tension 133
26. How to Calm Nerves 156
27. Are Tranquillizers Necessary 164
28. To be Likeable 167
29. Surviving Failure 171
30. Prayer and Faith 175
31. Role of Psychiatry 179
32. Epilogue 183
33. Stress Assessment Test 186

Tables

1. Life Stresses and their Significance 20
2. Environmental Factors and Stress 24
3. Heart Attack Risk Calculator 48
4. Sleeping Aids 55
5. Frequency of Depressive Symptoms at 1 and 13 months 70
6. Frequency of Physical Symptoms and Treatment at 1 and 13 months 71
7. Childhood Predictors of Adult Antisocial Behaviour 78
8. Aging Phenomena 92
9. Methods of Diversion in Stress Management 118
10. Benefits of Exercise 123
11. Anxiety Level Rating 159
12. Anxiety-trait Personality 161
13. Self-Rating Anxiety Scale 162

1

WHAT IS STRESS

"Stress like relativity, is a scientific concept which has suffered from the mixed blessing of being too well known and too little understood," says Dr. Hans Selye.

It is an old observation that stress or tension by itself can produce different diseases in man. People are known to have gone mad in a situation of extreme mental stress. They are also known to have died suddenly, obviously because of a heart attack. Yet it is not very long ago that the scientific proof of how it happens became known.

Stress Syndrome

In 1936, Dr. Hans Selye while doing research at the McGill University in Canada, made extracts of the ovaries of the female rats in order to study the effect of its hormones. He injected a new extract into female rats whose ovaries had already been removed. The results were as unexpected as they were baffling. He found the adrenal glands greatly swollen, the lymph nodes degenerated, and ulcers in the stomach and intestines. The whole body had in a way become a wreck.

He thought that he had inadvertently introduced a toxic material in the extracts that he had injected. Then

he injected, instead of the extract, a solution of a known toxic substance, formaldehyde. It produced a similar effect in the rats.

In spite of the said results, he was not entirely convinced that the effects were due to the injection of a toxic material. Could such effects be produced by other means? He kept his rats in the extreme cold on the roof top of his laboratory. Some of these rats lived for quite some time, but ultimately succumbed to such a treatment. Another batch of rats was put in motor-driven revolving cages and they ultimately died of exhaustion. Both the above groups of rats showed effects in their internal organs similar to those observed after the injection of the new ovarian extract or the injection of formaldehyde.

A picture emerged: an injection of an ovarian extract or of formaldehyde, or exhaustion due to prolonged cold or to prolonged exertion—the latter two acting only as non-specific stress—killed rats producing a picture of swollen adrenals, degenerated lymphatic system and stomach ulcers.

It became obvious to him that the effects produced in different organs were the result of the stress which the animals experienced in all these different situations. He still had to confirm his hypothesis.

By that time it was known that the pituitary controlled the action of different other hormonal glands, including those of the ovaries and the adrenals. Hans Selye thought that tampering with the pituitary might provide a clue to the action of the ovarian extract and thus explain the mode of action of stress upon the body.

He removed the pituitary glands in the rats and then repeated the above experiments. This time no

damage occurred. Next, he removed the adrenals but left the pituitary and then repeated the experiments. The body was damaged, though less than with the initial experiments. From these experiments, Selye concluded that stress produced its effect upon the body through the pituitary and the adrenals.

Such an effect occurred only in those rats who survived long enough in these experiments. Those who died much sooner did not develop such lesions.

Further experiments showed that when an animal was put under stress, its body responded immediately to it by making certain changes in its activities. When the stress was continued, these changes became a regular feature. And if the animal remained under stress for a prolonged time, these changes exhausted the body and ultimately caused its death.

To the initial response, Selye gave the name *Alarm Reaction* as it 'represented the bodily expression of a generalised call to arms of the defensive forces in the organism'. The next phase he called the *Stage of Resistance* as in this the animal adapted itself to the stress-producing environments. The last phase, he called the *Stage of Exhaustion* as in this the animal showed signs of premature wear and tear.

The entire syndrome, including its pattern of development in time, was called the *General Adaptation Syndrome.*

Alarm Reaction is the body's response when it is suddenly exposed to stimuli to which it is not adapted. This reaction has two phases:

Shock Phase. It is the initial and immediate reaction to the noxious stimulus. Various signs of injury such as rapid pulse rate, decreased temperature, lower

blood pressure and loss of muscle tone, are typical symptoms.

Counter Phase. This is a rebound reaction marked by the mobilization of defensive forces of the body, during which the adrenal cortex is enlarged.

The Stage of Resistance is when the person's full adaptation to the stress and the consequent improvement or disappearance of the symptoms occur. At this stage, however, there is a concurrent decrease in resistance to fresh noxious stimuli and stress.

The Stage of Exhaustion sets in if the stress is sufficiently severe and prolonged because body's adaptability to stress is limited and exhaustion inexorably follows. Various symptoms or diseases appear and if stress is unabated, death follows.

Selye's researches showed that stress or tension, particularly if it is prolonged, is very harmful to the body.

2

HOW DOES THE BODY FIGHT STRESS

Our body responds to stressful stimuli through nervous system and the release of hormones into the blood.

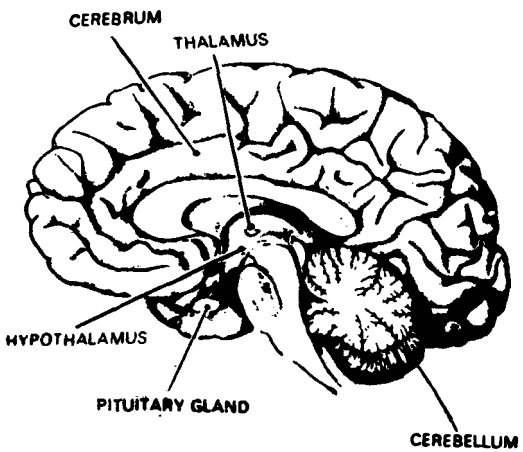
Of the nervous system, it is the sympathetic and parasympathetic nerves that are of importance in a situation of stress.

Normally, it is parasympathetic nerves which regulate and control the functioning of our internal organs. But when we are under stress, it is the sympathetic nerves that take over. The sympathetic nerves release a chemical substance called adrenaline at their nerve ends in different organs. The effect of adrenaline is to prepare the body to fight stress.

Pituitary

Among the hormonal glands, the pituitary and the adrenals play a major role during stress. Pituitary is about the size of a pea and weighs about half a gramme. It hangs from the undersurface of the brain and is enclosed in a bony depression at the base of the skull. It has two parts or lobes: the anterior lobe and the posterior lobe. Both of them produce different hormo-

nes. The posterior lobe secretes two hormones and the anterior, about ten.



Pituitary Gland in the Brain

Together these hormones control the activities of all the other hormonal glands, such as the thyroid, the adrenals, and the sex glands etc., and thus of the whole body.

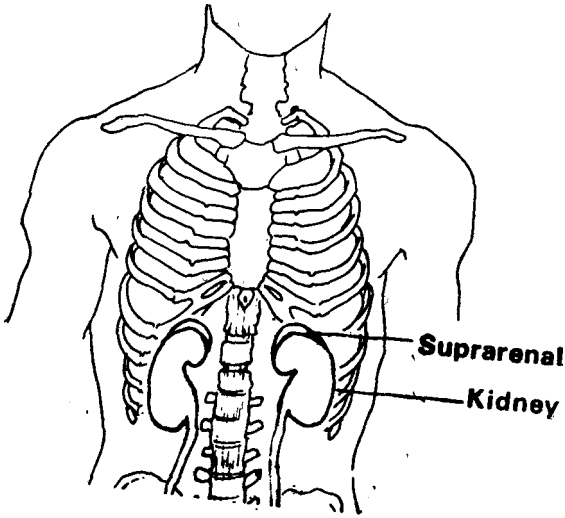
The cerebral cortex of the brain perceives stimuli from our environment and then passes on this information to another part, the hypothalamus. This, in turn, passes this information on to the pituitary, making it secrete the more or less quantities of all the hormones

to control other hormones as well as to control all the other activities of the body, according to the needs.

People react differently to different stimuli. How they react is registered by the brain and appropriate orders passed on to the hypothalamus and the pituitary. Those who over-react to day-to-day stimuli have their pituitary produce more hormones which first try to protect the body, but later on, the same hormones disrupt the working of the body.

Adrenals

There are two adrenal glands, also called suprarenals because they sit on top of the upper surface of the kidneys in the abdomen. Each one weighs about 5 grammes, is triangnular in shape and about the size of



The Suprarenals

the last phalanx of the thumb. It consists of an inner core called medulla and an outer rind called cortex. They produce different hormones small in quantilty, but extremely powerful.

Compared to its size, the potentialities of the adrenal are huge, like that of the pituitary.

As soon as a person faces a situation of mental or physical stress—hatred, fear, or rage necessitating flight or fight—cerebral cortex senses that stress and sends impulses to the hypothalamus, which in turn passes them to the medulla of the adrenal. The latter, at once releases two hormones, namely, adrenaline and noradrenaline, in the blood stream. These hormones at once make the liver release glucose, the source of energy. They constrict capillaries in the skin so that it looks pale and the blood contained in them is diverted to the muscles and the internal organs. The stomach stops the work of digestion of food, as that is not immediately necessary. Heart rate increases. The arteries constrict and as a result the blood pressure rises. Clotting time of blood is lessened so that in case of injury, the wound stops bleeding soon. All these changes equip the body to the tremendous task to flight of fight—whichever it chooses to perform.

The body, naturally, cannot remain geared in such a situation for long, otherwise it would exhaust itself. After a little while, the impulses from the hypothalamus stimulate the pituitary to release another hormone called ACTH (adrenocorticotrophic hormone). This hormone acts upon the cortex of the adrenals which produce and release in the blood its hormones. The job of these hormones is to restore normal balance of the body, i.e., to lower the raised blood pressure by dilating

the blood vessels, to produce more sugar from the fat and proteins already in the body, etc.

While the adrenals wind and unwind the body when it is in a state of mental or physical stress, there is a limit to which it can perform its function effectively. If stimulated too often and for longer periods, the changes brought about in the body—such as raised blood pressure, interruption of digestion in the stomach—become more or less a regular feature of the body.

Diseases of Stress

Stress can disrupt the normal working of the body in two ways: (1) by being beyond our power of adaptability, or (2) by causing disease because there is a particular weakness in the structure of our body. Think of a chain placed under tension—that is, physical stress. No matter what pulls on the chain and no matter in which direction, the result is the same. Just as in the chain the weakest link is most likely to break down, so in the human body there is always one organ or system, which owing to heredity or external influences is the weakest and most likely to break down under general biological stress. In some people the heart, in others the nervous system or the gastrointestinal tract, may represent this weakest link. That is why people develop different types of diseases under the influence of the same kind of stress. This is also why, strictly speaking, the pure stage of exhaustion is never reached. Before all adaptation energy is depleted, the weakest link breaks down, causing an immediate general collapse.

Ageing Due to Stress

True physiologic ageing is not determined by the time elapsed since birth, but by the total amount of

wear and tear to which the body has been exposed. There is, indeed, a great difference between physiologic and chronologic age. One man may be much more senile in body and mind at forty than other person at sixty.

According to Hans Selye: "Many people believe that, after they have exposed themselves to very stressful activities, a rest can restore them to where they were before. This is false. Experiments on animals have clearly shown that each exposure leaves an indelible scar, in that it uses up reserves of adaptability which cannot be replaced. It is true that immediately after some harassing experience, rest can restore us *almost* to the original level of fitness by eliminating acute fatigue. But the emphasis is on the word *almost*. Since we constantly go through periods of stress and rest during life, just a little defecit of adaptation energy every day adds up—it adds up to what we call ageing."

3

FACTORS THAT PRODUCE STRESS AND TENSION

A certain degree of mental tension and stress is part of our daily living; like living in a metropolitan city, waiting in a bus queue or boarding it, driving on a busy road, an argument with a colleague or a friend, disagreement with wife or grown-up children, etc. For such momentary tensions and stresses, our body is equipped to deal with immediately and effectively.

There are other stress-producing situations which are severe in intensity or last longer. The body tries to adapt itself to such situations, but, sometimes, in the process, it exhausts itself.

It is not necessary that only the unpleasant situations produce stress, even the pleasant ones can have a similar effect. An example of the latter is receiving the news of winning a big lottery: this can produce an immediate as well as prolonged stress effect upon the body, and some people are known to have succumbed to it.

Stress-producing Events

Lately, Dr. Thomas H. Holmes and his colleagues at the University of Washington School of Medicine in Seattle, prepared a long list of different events or

factors that create different degrees of stress in people. They gave marks to these events and stated that an accumulation of 200 or more marks in a single year is liable to disrupt the health of the individual. The following is the list of the events prepared by them. The marks against each indicate its severity:

Table 1

Life Stresses and Their Significance

Life Stresses*	Mark Value
1. Death of spouse	100
2. Divorce	73
3. Marital separation from mate	65
4. Detention in jail or other institution	63
5. Death of a close family member	63
6. Major personal injury or illness	53
7. Marriage	50
8. Being fired at work	47
9. Marital reconciliation with mate	45
10. Retirement from work	45
11. Major change in health or behaviour of a family member	44
12. Pregnancy	40
13. Sexual difficulties	39
14. Gaining a new family member (e.g., through birth, adoption, or oldster moving in, etc.)	39
15. Major personal readjustment (e.g., merger, reorganization, bankruptcy, etc.)	39
16. Major change in financial state (e.g., a lot worse off or a lot better off than usual)	38

17.	Death of a close friend	37
18.	Changing to a different line of work	36
19.	Major change in the number of arguments with spouse (e.g., either a lot more or a lot less than usual regarding child-rearing, personal habits, etc.)	35
20.	Taking on a mortgage greater than Rs. 1,00,000 (e.g., purchasing a home, business, etc.)	31
21.	Foreclosure on a mortgage or loan	30
22.	Major change in responsibilities at work (e.g., promotion, demotion, lateral transfer)	29
23.	Son or daughter leaving home (e.g., marriage, attending college, etc.)	29
24.	In-law troubles	29
25.	Outstanding personal achievement	28
26.	Wife beginning or ceasing work outside the home	26
27.	Beginning or ceasing formal schooling	26
28.	Major change in living conditions (e.g., building a new home, remodeling, deterioration of home or neighbourhood)	25
29.	Revision of personal habits (dress, manners, associations, etc.)	24
30.	Troubles with the boss	23
31.	Major change in working hours or conditions	20
32.	Change in residence	20
33.	Changing to a new school	20
34.	Major change in usual type and/or amount of recreation	19
35.	Major change in church activities (e.g., a lot more or a lot less than usual)	19

36.	Major change in social activities (e.g., clubs, dancing, movies, visiting, etc.)	18
37.	Taking on a mortgage or loan less than Rs. 1,00,000 (e.g., purchasing a car, T.V. freezer, etc.)	17
38.	Major change in sleeping habits (a lot more or a lot less sleep or change in part of day when asleep)	16
39.	Major change in number of family get-togethers (e.g., a lot more or a lot less than usual)	15
40.	Major change in eating habits (a lot more or a lot less food intake or very different meal hours or surroundings	15
41.	Vacation	13
42.	Christmas	12
43.	Minor violations of the law (e.g., traffic tickets, jay-walking, disturbing the peace, etc.)	11

Interpretation

0-149—Low stress
150-199—Mild stress
200-299—Moderate stress
300 or more—Major stress

*Holmes T.H. and R.H. Rahe, "The Social Readjustment Rating Scale", *Journal of Psychosomatic Research* H (1967).

Impact of these events on the health of an individual is indicated from some findings. For example, death rate in widows or widowers is ten times higher during the first year of the loss of life-partner as com-

pared with other people in the same age group. Illness rate is twelve times higher in divorced people than in married persons. Eighty per cent of serious physical illness develops at a time when the person feels helpless and hopeless in a situation.

Susceptible Individuals

In some persons, a given situation produces more stress than in others. Studies have been conducted on such persons. Some of the features that characterise them are as follows:

1. They are highly susceptible to annoyance.
2. They lack confidence in untried performance.
3. They can recall fewer friends.
4. They show inconsistency in their responses to similar situations.
5. They are suspicious of the motives of others.
6. They are more prone to guilt feelings.

Physical examination of such people reveals these signs and symptoms:

1. High respiration and pulse rate.
2. Increase in systolic blood-pressure.
3. Increased BMR (basic metabolic rate).
4. Decrease in electrical skin resistance.
5. Decrease in alkalinity in saliva.
6. Increase in hippuric acid in urine.
7. Increase in 17-OH-ketosteriods in urine.

Stress-producing Occupations

Investigations have also been conducted as regards various occupations and the stress level which they generate.

Some of the professions or occupations that generate a high to moderate degree of mental tension include that of the executive (business, managerial), sales-manager, salesman, accountant. Under the condition of worry, over-work fatigue, some people pull on for some time, and then they break down with different diseases either singly or in combination. Some get high blood-pressure, others hardening of the blood vessels and coronary heart disease, others still, rheumatoid arthritis.

Table 2

Environmental Factors and Stress

Factor or Condition	Stress Response
Diet	Poor diet means poor resistance to stressors.
Drugs	Alcoholism means impaired response.
Occupation	Accountants get high blood pressure during tax time, business executives are prone to ulcers.
Location	City living is more stressful.
Family situation	Single people have higher incidence of stress-related diseases and disorders.
Social situation	Socially isolated persons are more prone to disease and tend to die prematurely.
Religious affiliation	Deeply religious persons seem to manage severe stresses well.
Emotional stability	Stable people react well to stress.
Ability to relax	Negative effects of stress may be overcome by those who can relax.

*Morse and Furst (1979)

4

STOMACH ULCERS AND TENSION

It was in 1822, that a young man named Alexis St. Martin got injured in the abdomen when a gun being carried by one of his friends went off accidentally. A gaping hole about the size of a fist appeared in his abdomen and there seemed to be no chance of his survival. As luck would have it, he survived it with the help of a doctor named William Beaumont. But the gaping hole in his abdomen became a permanent feature. The outer wall of his abdomen and the inner wall of the stomach adhered together in the process of healing so that the food he took through his mouth could be seen being digested in his stomach.

Dr. William Beaumont helped this patient medically and financially. He was keen about retaining this patient with him so that he could make some direct observations on the process of digestion of food in his stomach. Beaumont succeeded in making a total of 238 experimental observations and on the basis of that, he wrote a book which is now considered as a classic.

Beaumont observed that the innermost layer of an empty stomach looked pale-pink and velvety and was coated with mucus. As soon as the food was put in the mouth, this surface became more pink and bright in

colour and from beneath the mucus coating started oozing out hundreds of transparent droplets which collected in the stomach. When food reached the stomach, it contracted more often and more fluid appeared there which engulfed the food and started disintegrating it.

When Martin lost his temper during an experiment with food, it took much larger time for the food to be digested. This was the first observation of the effect of emotion on the function of digestion.

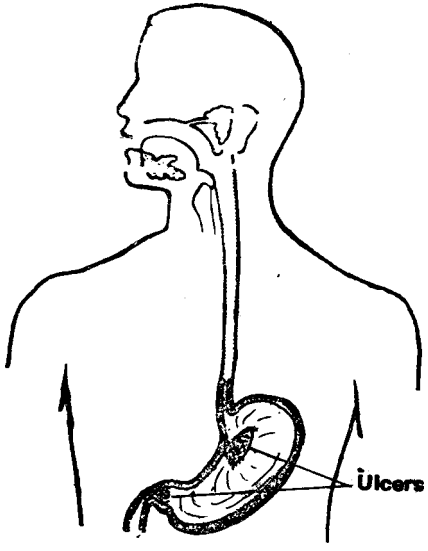
Since then quite a few observations have been made about the effect of different emotional states on the function of digestion and on the state of health of the stomach. As a result of these observations it has been found that mental tension and stress in the form of anger and hatred, frustration and dejection, not only hamper and delay the digestion of food, but also make one more susceptible to getting stomach upsets and ulcers.

Causation

What exactly is the mechanism of the formation of these ulcers is not known with certainty. This much, however, is clear that in these patients there is lessening of the resistance of the inner lining of the stomach to the corroding action of hydrochloric acid which is normally secreted and is present in the stomach.

These ulcers occur more often in the duodenum—the part of the small intestine that joins the distal end of the stomach. In a person who is under mental stress, the peristaltic contractions of the stomach occur more often, pouring the contents of the stomach (the food as well as the gastric juice) into the duodenum. While the inner lining of the stomach is protected with a thin layer

of mucus from the corroding action of hydrochloric acid the duodenum has no such lining to protect it. When the process goes on over a period of time, the lining of the duodenum gets denuded and an ulcer forms over there.



Ulcers in stomach

Duodenal ulcers are seen more often in males and in young men, in the age group of 30 to 40 years. These people are usually well educated, intelligent, earnest and ambitious.

Symptoms

To begin with, there are only vague symptoms such as diminished appetite or stomach upset. Gradually

with all these symptoms, appears pain in the upper abdomen a little to the left of the middle line. These symptoms are aggravated when the person is more tense and under stress. Also the symptoms come more often when the stomach is empty, as for example, after midnight. Many a time, the symptoms appear at the same time of the day or night. There are, however, spontaneous remissions in between for weeks together. The symptoms last for 6-8 years and in many patients they gradually lessen and then disappear. Some patients develop complications of the disease, as for example, haemorrhage from the ulcer when the patient may vomit blood and may have blood in the stool as well, or there may be perforation of the wall of the stomach with inflammation.

Ulcers develop inside the stomach also in its distal one-third. These ulcers appear more often in older people in the age group of 40-50 years and they occur as commonly in males as in females.

Wherever the ulcer may be, in the stomach itself or in the first part of the duodenum, the treatment is more or less the same.

Treatment

To cope with it, smoking, drinking of spirituous liquors, spicy food or excessive use of tea or coffee should be avoided. It has been found that the stomach-ulcer patients who do not smoke heal up earlier and have lesser chances of getting haemorrhage than those who smoke and continue smoking.

The patient should take less quantity of food each time; he may take more frequently. He should also take a light meal at midnight. Liquid food, particularly milk,

is recommended when the symptoms are acute. Regularity in eating habits must be observed.

If the symptoms are acute or they persist, antacids, anti-cholenergic drugs and sedatives are recommended; so also the physical and mental rest.

When the patient is having a remission in symptoms he should avoid over-eating and also take care that his stomach does not remain empty for too long.

Taking of aspirin is strictly forbidden to such patients. Aspirin irritates and denudes the inner lining of the stomach, and in those who are susceptible to get ulcers, may precipitate the onset of the symptoms.

The patient must reorient his thinking. He should accept what cannot be helped and avoid getting involved in stress-producing situations. These measures are more important in getting rid of the disease.

5

MENTAL TENSION AND HIGH BLOOD PRESSURE

Another disease that is associated with mental tension is high blood pressure.

Blood Pressure is the pressure exerted by the blood against the walls of the arteries through which it flows. Blood pressure is highest each time the heart contracts and pumps out blood into the arteries. The reading at this time is called systolic, as sytole means heart contraction. The blood pressure falls to its lowest level when the heart is relaxing. This reading is called diastolic, as diastole means heart relaxation. Both these blood pressure readings are generally recorded as the higher systolic pressure over the lower diastolic pressure for example, 125/85.

Since there is no dividing line between normal and high blood pressure, arbitrary levels have been established to define those who have an increased risk of developing a heart or blood vessel (cardiovascular) disorder and/or will clearly benefit from medical therapy. For example, patients with a diastolic pressure greater than 90 mm Hg will have a significant reduction in disease and mortality with adequate treatment. These then, are patients who have hypertension and who should be considered for treatment.

The level of systolic pressure is also important in assessing arterial pressure's influence on heart disease. Males with normal diastolic pressures (less than 82 mm Hg) but elevated systolic pressures (more than 158 mm Hg) have a 2½fold increase in their cardiovascular mortality rates when compared with individuals with similar diastolic pressures but whose systolic pressures are normal (less than 130 mm Hg).

Even though in an adult hypertension is usually defined as a pressure greater than or equal to 150/90, in men under 45 years of age, a pressure greater than or equal to 130/90 mm Hg may be elevated.

Individuals can be classified as being normotensive if arterial pressure is less than the levels noted above and as having *sustained* hypertension if the diastolic pressure always exceeds these levels. Arterial pressure fluctuates in most persons, whether they are normotensive or hypertensive. Those who are classified as having labile hypertension are patients who sometimes but not always have arterial pressures within the hypertensive range. These patients are often considered to have borderline hypertension.

Blood Pressure Regulation

The degree of blood pressure is regulated by various factors. The kidneys participate in this regulation. Stimuli from the nervous system and the consequent body responses, particularly the hormonal secretions of various endocrinal glands of the body are the important ones. These factors influence the blood pressure level by controlling the relaxation or contraction of the smaller arteries called arterioles. If the arterioles relax readily, the blood forced out by the heart can be accommodated

in the vessels easily without heightening the blood pressure.

But if the arterioles do not relax readily, then as the blood is forced into them by the heart, the pressure in them rises and remains high even in diastole. This progressive lack of relaxation of blood vessels increases blood pressure over a period of time.

In most cases of hypertension, the cause is not clearly discernible. These cases are called Idiopathic Hypertension or Essential Hypertension—though the last is a misnomer as there is nothing essential about this high blood pressure.

Symptoms and Signs

The majority of patients with hypertension have no symptom referable to their blood pressure elevation and will be identified only in the course of a physical examination. When symptoms do bring the patient to the physician, they fall into three categories. They are related to (1) the elevated pressure itself, (2) the hypertensive vascular disease, and (3) the underlying disease in the case of secondary hypertension.

Though popularly considered a symptom of elevated arterial pressure, headache is characteristic only of severe hypertension: most commonly it is localized to the back of the head, is present when the patient awakens in the morning, and subsides spontaneously after several hours. Other possibly related complaints include dizziness, palpitations, and easy fatigability.

Complaints referable to vascular disease include epistaxis, blood in urine, blurring of vision owing to retinal changes, episodes of weakness or dizziness due to transient cerebral ischaemia, angina pectoris, and dyspnoea due to heart failure.

Examples of symptoms related to the underlying disease in secondary hypertension are varied.

A strong family history of hypertension, along with the reported finding of intermittent pressure elevation in the past, favours the diagnosis of essential hypertension.

Many people think they can tell high blood pressure is present by headaches or other symptoms. The fact is that the only way to know if the blood pressure is raised is by having it measured by blood pressure measuring apparatus—sphygmomanometer.

Prognosis

Insurance statistics show that, in general, expectation of life is considerably reduced in those who have high blood pressure compared with those in whom the pressure is within the normal range. However, it does not follow that all who have high blood pressure necessarily have a bad prognosis. The condition is mild if the heart is not enlarged, the retina of the eyes (fundus) show no abnormalities and there is no protein in urine (proteinuria) or evidence of impaired kidney function. Many such patients live a life of normal span free from related illness.

On the whole, women seem to withstand hypertension better than men.

Young men, in particular, who when first seen have high diastolic pressures together with secondary manifestations in the fundi or heart require optimal control of the blood pressure without delay.

Consequences of Hypertension

As the blood vessels do not relax to receive the blood from the heart, the heart has to work harder

against this resistance. This strains the heart, so that it ultimately fails to perform its function of pumping the blood to all parts of the body.

Hypertension accelerates the process of hardening and narrowing of the blood vessels. This affects the coronary arteries, leading to less blood and less oxygen being supplied to (1) the heart muscle (myocardium), and myocardial infarction or angina, (2) cerebral arteries leading to brain strokes, and (3) renal arteries leading to less blood going through these arteries for purification and collection of waste products in the blood, the condition called uraemia.

Hypertension enhances atherogenesis by directly producing injury via mechanical stress on endothelial cells at specific high pressure sites in the arterial tree. In addition, hypertension might allow more lipoproteins to be transported through intact endothelial lining cells by altering permeability.

High blood pressure is found in about 50 per cent of men and in about 75 per cent of women with coronary heart disease. In the Framingham study in the U.S.A., it was found that a blood pressure reading of greater than 160/90 mm. Hg., produced a threefold increase in risk of heart attack for men between 50 and 59 years of age and a six-fold increase in risk for women of the same age. An increase in coronary heart disease occurred at each successive level of blood pressure, with a seven-fold increase in those with blood pressure over 180 compared to those with pressure under 120 systolic. Experimentally-induced hypertension increased the severity of atherosclerosis in laboratory animals such as rabbits, dogs, chicks and rats.

Treatment

Blood pressure, which is higher than normal, causes excessive stretching of the blood vessel wall and hastens its wear and tear. It accelerates the process of atherosclerosis. Other factors aside, people with high blood pressure are reported to have five times more heart attacks than those who have normal blood pressure.

Salt Intake and Blood Pressure

In a large majority of patients, who have high blood pressure, it is not yet possible to find out the cause of the condition; the condition is thus labelled as Essential Hypertension. In these patients, however, some interesting observations have been made about their habit of eating salt (common table salt: sodium chloride).

In early 1950s, a large number of men were checked about the quantity of salt they took in their diet and their blood pressure. These people were divided into three groups: in the first group were those who never salted their food (yet it contained 2 to 3 gms. of salt as a constituent of daily diet); second, who took 4 to 10 gms. of salt a day; and, third, who took 12 to 18 gms. of salt.

It was found that in the high-salt group, 10 per cent people had hypertension; in the moderate salt group, 7 per cent had hypertension; and in the low-salt group, there was no case of hypertension.

This finding was subsequently confirmed by animal experiments. Two groups of rats were put on high and low salt. The high-salt group developed hypertension; when out of this group, some of the rats were

put on even higher salt diet, their blood pressure increased further.

It has been found that hypertension patients, on the whole, feel satisfied about the adequateness of salt in their diet only when there is a higher than ordinary content of it in it.

The above studies indicate that high salt content in the diet increases blood pressure. The converse is also true in many cases of hypertension: lowering salt content of their diet lowers their blood pressure.

Lowering salt content in the diet or even omitting it altogether has no adverse effect upon health. Actually, there is enough natural salt in the vegetables and other foods including milk (mother's milk contains much less salt than cow's or buffalo's milk). In the past, salt was not available to people living in many areas of the world. In our country, many sadhus and ascetics are known to abstain from taking salt for years together. They are none the worse for it; in fact, they say they enjoy better health because of lack of salt.

As a result of the above observations, many pharmaceutical firms have come up with drugs that increase the passage of salt in the urine, thereby depleting the body of the salt which the patient has taken. Unfortunately, however, with the salt (sodium chloride) other essential salts are also drained out in the process so that the patient feels weak and has other side-effects.

Thus we see that in order to lower blood pressure, it is better to use less salt in the diet and not to depend upon drugs to do this job.

Foods particularly high in salt are: pickles, *chutt-nies*, canned or bottled soups and vegetables, sausages,

hot dogs, ham, bacon, salted nuts, popcorn, potato chips.

Alkalizers you take for stomach upset, e.g., Eno's fruit salt and even chewing tobacco has excess salt.

In order to limit your salt intake:

(1) Don't put salt in any article of food at the table,
(2) Take the help of different spices to remove the bland taste in unsalted diet.

The patient has to realise that once drug treatment is embarked upon, it will need to be continued for life at least in the present state of our knowledge. The establishment of a good relationship between the doctor and the patient is very important. The previously asymptomatic patient who develops side-effects of treatment need particular help: appropriate adjustment of the dose, or change of drug may restore his confidence. The treatment has to be reviewed regularly; whether the supervision should be by a general parctitioner or by hospital doctors with a special interest in hypertension, depends on many factors and should be decided by the patient.

Approach to Drug Therapy

The aim of drug therapy is to use the drugs alone or in combination, to return arterial pressure to normal levels with minimal side effects. When used in combination, drugs should be chosen for their different sites of action. Those who have higher blood pressure (average diastolic pressure 130 mm. Hg. or more) will require more intensive therapy with several drugs simultaneously.

For patients requiring multiple drugs, once the appropriate combination has been found, the use of a

single pill with the appropriate combination of drugs may simplify the regimen and thereby increase compliance. Every effort should be made to reduce the number of times each day the patient must interrupt his or her schedule for medication.

Probably fewer than one-third of hypertensive patients get treated effectively. Only a small number of these failures is related to drug unresponsiveness. The majority is related to (1) failure to detect hypertension, (2) failure to institute effective treatment of the asymptomatic hypertensive subject, and (3) failure of the asymptomatic hypertensive subject to adhere to therapy. In order to improve this deficiency, patients must be educated to continue treatment once an effective regimen has been identified. Side-effects and inconveniences of treatment must be minimised or counteracted in order to obtain the patient's continued cooperation.

Oral Diuretics

Combined with moderate salt restriction these are effective in lowering blood pressure, initially by reducing blood volume, and over a longer period by reducing peripheral arteriolar resistance, probably in part by removing salt from the arterial media. They are particularly useful for minor degrees of hypertension. Many have the disadvantage of causing excessive potassium loss. A cheap long-acting thiazide diuretic together with potassium supplement is appropriate. Rapidly acting diuretics such as frusemide are less useful, unless there is accompanying heart or kidney failure. Diuretics are also a useful adjunct to other forms of treatment.

Of the sympatholytic drugs, the beta adrenergic receptor blocking drugs are now the most widely used.

Propranalol is effective and its reliability and relative freedom from side-effects appears to be established. The dose has to be adjusted to the individual's need. The combination of propranalol and a diuretic usually with a potassium supplement achieves the therapeutic goal without significant side-effects in a high proportion of patients with essential hypertension.

If this proves not to be the case, other sympatholytic agents may be effective. Clonidine starting with 0.1 mg. three times a day and rising to 1 mg in total per day, has a predominantly central action. Methyldopa, starting with 250 mg three times a day and rising to 3 gm total per day, has both a central and peripheral action.

6

MENTAL STRESS AND HEART

When someone says, 'My heart felt heavy', or 'My heart felt light', or 'I missed a few beats of my heart', it is not merely a verbal expression; modern medical science is discovering that it actually can be so. Heart feels the effect of our different emotional states and is affected by them. A person's attitude towards life and his emotions are linked with the state of health of his heart.

Causes of Heart Attack

In more affluent countries it has been estimated that 10 per cent adults between the age of 30 and 60 years are liable to suffer from heart attack during the next decade.

Those who are anxious-type, ambitious, competitive and who push forward in spite of odds and obstructions, are more liable to have coronary disease which leads to heart attacks.

There are other factors also which predispose one to getting heart attacks. These are: history of heart attacks in the parents, high blood-pressure, over-weight, diabetes, high level of cholesterol in the blood, and smoking. Males suffer from the disease much more than females. After menopause, females also have increased

incidence of the disease; it is suggested that female sex hormones have a protective influence against coronary heart disease.

It has been found out that those who have high levels of cholesterol in the blood above 200 to 250 mg/ 100 ml of blood suffer more often from heart attack. Cholesterol is produced in the body by the liver, it is also present in greater quantity in things like butter, cream, ghee and eggs. Vegetable oils do not contain cholesterol.

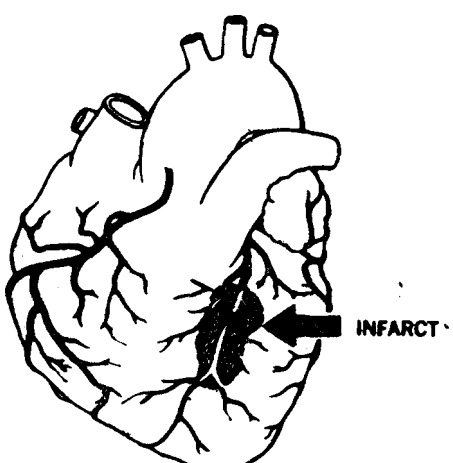
Lack of physical exercise predisposes one to getting coronary heart disease. Heart attacks are common in people who eat rich diets but have sedentary occupations and do not do physical exercise. Furthermore, it has lately been found out that only strenuous physical exercise has a protective effect; mild physical exercise has no such protective effect.

One of the most important factors that predisposes one to heart attacks is the tendency to push ahead in every way. Rushing through work and rushing even in relaxation is most detrimental to the heart. Some time back, a comparative study was conducted on 575 male twins born in Ireland who lived for 20 years there, and later on one of the twins shifted to Boston, USA, and lived there for at least 10 years. It was found that the twin brother who shifted to the USA, suffered more from heart attacks and coronary heart disease, than his counterpart in Dublin, Ireland. This was in spite of the fact that the Dublin brother ate more fat, put on more number of hours of work in a day and had a lower level of cholesterol in the blood. The important difference noted was that whereas the twin in Boston was always in a hurry in anything he did, his brother in Dublin did more physical work, yet was never in great hurry.

Coronary heart disease does not occur suddenly though its effect may appear to be a sudden process. The disease has a long incubation period, as long as 20 years.

Mechanism

Our heart which acts essentially as a pump to push forward the blood, is made up of strong, tough and dependable muscle. In order to supply nourishment to it, there are the two coronary arteries which supply it richly with blood. Heart muscle makes 1/200th in weight of the whole body, yet it receives 1/20th of the total supply of blood for its noruishment. The internal calibre of the coronary arteries narrows in predisposed people; the inner lining gets deposited on it fatty material much of which is cholesterol.



Infarction in Heart

In such a condition, lesser blood passes through narrowed coronary arteries, and when it cannot meet the demands of the body, the heart suffers. If it is a momentary event, the patient suffers from a constrictive pain over the heart, usually, a little to the left of the sternum. This pain may be radiated to the left arm, wrist and to some other places. Stopping physical exertion at once gives relief from this pain. This disease is called Angina Pectoris.

If in a narrowed coronary artery a block occurs, then the part of the heart muscle which gets no blood at once shrivels up and dies. The patient has acute pain in chest, which is not relieved even after stopping physical exertion. There is cold sweat on the face, maybe breathlessness also and a feeling that one is passing away.

Such a clinical picture is fairly diagnostic, yet it can be confirmed by taking an ECG (electro-cardiogram) test. This is a record of the electric impulses that pass normally over different parts of the heart. In case the heart muscle is injured or dead in any part due to coronary artery blockage, the impulse record is changed. Furthermore, the injured heart liberates in the blood stream some enzymes such as GOT (glutamic transaminase) and LDH (lactic dehydrogenase), increase in whose level is indicative or is helpful in diagnosis. If there has been a cardiac infarct of moderately severe intensity, white blood cells (polymorphonuclears) increase in the blood, and there may be some fever as well.

If the cardiac infarct is very extensive, or it interferes with the conduction of electrical impulse, or a state of shock sets in, there is danger to life.

Medical Treatment

A patient of heart attack needs immediate attention. He needs physical and mental rest. As he must not work or exert, he is given a sedative, or the doctor gives an injection of pethidine or morphine. Oxygen is helpful if there is breathlessness. Other treatment depends upon the extent of the lesion and the degree of symptoms. If heart failure sets in, it needs to be treated. Any other accompanying disease like diabetes or hypertension also needs attention. In an hypertensive patient, blood-pressure comes down automatically after an attack and it rises again after the recovery.

It takes about 6 weeks for the injured or dead part of the heart to recover, or compensate, hence the patient has to restrict his physical and mental activities for this duration. Recommendations about the period of rest vary, and they also depend upon the severity of the attack or the accompanying diseases.

Some infarcts give rise to no symptoms at all, or the patient does not notice them. It is only when an ECG is taken that the earlier infarcts are detected.

A heart attack is a warning to the person that some changes are needed to be made in the manner of his living.

He must do limited physical exercise after complete recovery. Long walks are ideal for this. In an abnormally fat patient, stress has to be laid on losing extra weight. Hypertension and diabetes have to be kept under control.

Much more important is changing the philosophy of living. Too much of hurry and rush of life has to be cut off. One must accept things as they are, rather than to go into physical and mental stress in an effort to change them.

Regular medical check-up after the attack is essential. This includes physical examination by the doctor, ECG, estimation of blood cholesterol and examination of urine. Advice of the doctor should be followed. Smoking must be stopped. Over-eating is to be avoided at any time.

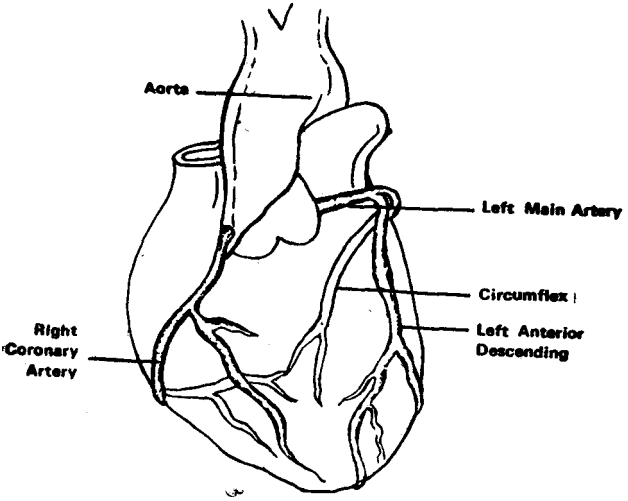
Surgical Treatment

Attempts have been made to help the patients of coronary heart disease by means of surgery. The essential lesion being narrowing or obstruction of the coronary arteries, the surgical attempts have been directed towards supplying the much-needed blood to the heart muscle indirectly by grafting some other source of blood to it.

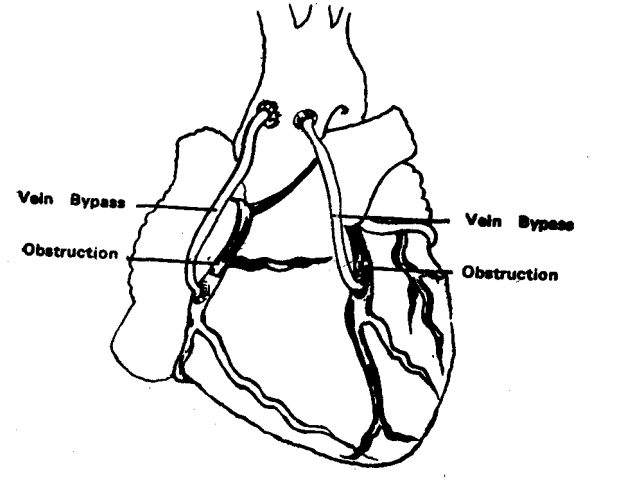
After the trial of many indirect and some direct techniques in experimental animals and patients, all of which either failed or succeeded only partially, in 1967, Rine Favaloro, removed a section of the saphenous vein from the leg, grafted one end of it into the aorta and the other end into the coronary artery at a place where it was healthy, thus by-passing the obstructed or narrowed segment of the coronary.

Since this procedure by-passes the coronary obstruction, it is called coronary by-pass operation, and since it connects the aorta directly with the coronary artery, it is also called aorto-coronary procedure.

A combined surgical procedure now undertaken is as follows. The patient is put to sleep with a general anaesthetic. An incision is made in a leg to remove a segment of saphenous vein from groin to knee, which is then tested for its patency and all clear calibre. Another surgeon opens up the chest at the same time. The patient is connected to the heart-lung machine.



Normal Heart



Bypass operation

This consists of a pump and an oxygenator. Blood is withdrawn from the venae cavae, passed through the oxygenator and returned into the arterial circulation through the femoral artery or ascending aorta. The blood is thus diverted completely from the heart and lungs (extracorporeal), but a good supply of well-oxygenated blood is made available to the vital organs. Heart-lung machines provide the surgeon with periods for intracardiac surgery of between two or three hours with safety.

This operation is done on the patient when the temperature of his body is less than normal (hypothermic), around 29° to 30°. This reduces the oxygen requirements of the vital organs and thus the operative procedure can be carried along for a longer time.

The surgeon touches two electrodes to the heart and passes in a shock. The heart begins to fibrillate, i.e., instead of contracting as usual, it begins to quiver only, so that it can be handled. Now the surgeon cuts away overlying tissues, and comes to the coronary artery which is blocked. A clamp is put on the aorta which cuts off the flow of blood to the coronary arteries and the heart stops making any movement. During this period, the surgeon takes a section of the vein, cuts the end obliquely, and with suture material as fine as a thin hair, stitches it to a slit in the aorta. The other end of the vein is stitched on the coronary artery beyond the obstruction or narrowing. This procedure is then repeated for any other by-pass that is necessary.

After this is done, the heart is restarted and the patient is disconnected from the heart-lung machine. Improvement is evident at once. Through the by-pass more blood flows to feed the heart muscle.

Table 3

Heart Attack Risk Calculator

Risk Factor	*0*	*1*	*2*	*3*
1. Family history of heart attack	Nil	Parents/siblings after age 60	Parents/siblings before age 60	Parents/siblings/uncles/ aunts before age 60
2. Sex	Female before menopause	Male/or post-menopause female	Male/or post-menopause female	Male/or post-menopause female
3. Age	20-40	41-50	51-60	over 60
4. Bl. Pr. Systolic	Under 120	120-139	140-159	160-over
5. Bl. Pr. Diastolic	Under 89	90-99	100-119	120 over
6. Diabetes	No	Yes	Yes	Yes
7. Cigarette smoking	No	Upto 10 cigarettes/day	Upto 20 cigarettes/day	More than 20 cigarettes/day
8. Blood cholesterol	Under 170	170-249	250-299	300-over
9. Body weight	Less than normal or normal	Upto 5 kg over-weight	Upto 10 kg over-weight	Over 10 kg over-weight
10. Exercise/Job	Active exercise/active job	Nil/Sedentary	Nil/Sedentary	Nil/Sedentary

Score	*Risk*
Under 5	Very low
6-10	Low
11-15	Moderate
16-20	High
Over-20	Very High

Surgical techniques have been developed to the point where upto ten anastomoses are being fixed in one single patient and myocardial revascularization can be safely performed even in cases with markedly impaired myocardial function.

Results of the surgical treatment depend upon the condition of the patient's heart and his coronary arteries as well as on the capabilities of the surgical team doing the operation. Operative mortality has been minimized and long-term survival results are encouraging.

7

MENTAL TENSION AND SLEEP

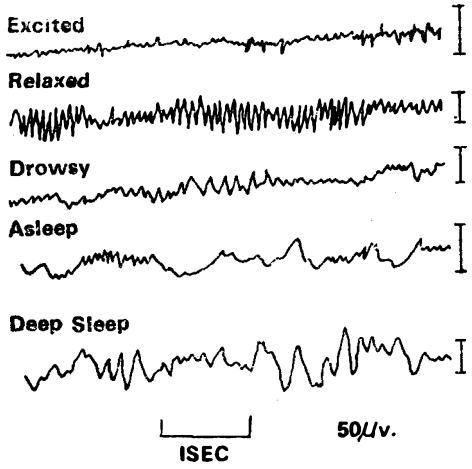
Mental tension diminishes sleep, and the diminished sleep in turn causes mental tension. All of us have had diminished and disturbed sleep when under mental tension. If it happens only once in a while, it hardly leaves behind any effect. But if it happens night after night for weeks together, it seriously tells upon the health, the initial symptoms of which are irritability of temper, fatigue and incapacity to concentrate on any work.

Proper and adequate sleep is essential for health. One can easily do without food for a week, but not without sleep. Sleep replenishes the brain and the body; it relaxes the mind and the muscles, it charges the body with energy.

Physiology of Sleep

The phenomenon of sleep is still not understood properly. That, however, is not due to lack of efforts; it is inherently a difficult field of study. Observations have been made on people in their sleep. These observations include study of the temperature, pulse and respiration rate, bodily movements and movements of the eye-ball, and most importantly, of the electrical waves that arise from the brain in different phases and stages of sleep.

This last observation is done with the help of an apparatus called Electroencephalogram, commonly abbreviated as EEG. This has revealed some interesting information.



Sleep Variations

It has been found that lesser number of electrical waves arise over the brain when one is asleep than while one is awake. During sleep these waves are flater, more like ripples than like spikes. Also the number of waves per second and their shape varies with the soundness of the sleep—the sounder the sleep, the lesser and flater the number of waves. Another important observation is

regarding the rapid eye-ball movements during sleep. As one passes from semi-consciousness to sleep, a phase of rapid eye-ball movements occurs. This is also the phase when one dreams the most.

People who have diminished and disturbed sleep have shorter periods of rapid eye-ball movements and also shorter periods of slow and flat brain waves.

It has been observed that one passes from wakefulness to sleep in a series of cycles, each cycle lasting from 60 to 90 minutes. During the full night's sleep, one may go through five or six such cycles of sleep. Usually it is only for twenty-five per cent of the number of hours of sleep that one dreams.

How much sleep does one need? This question excites controversy. Generally speaking, it can be said that one needs as many hours of sleep as with which one gets up fresh and is up and about during the day. This varies from individual to individual, and with age as well. Usually, it is between five and a half to eight and a half hours per day. Children sleep for longer hours. Older people sleep for lesser number of hours and in the case of the latter, the quality of sleep is also different; it is not a very sound sleep.

Writing on the subject of sleep and insomnia, Hans Selye said, "The stress of a day of hard work can make you sleep like a log or it can keep you awake all night. This sounds contradictory, but if you come to analyze the work that helps you to sleep and the work that keeps you awake, there is a difference. *A stressful activity which has come to a definite stop prepares you for rest and sleep; but one which sets up self-maintaining tensions keep you awake.* The fatigue of work well accomplished gets you ready for sleep."

Explaining further, Selye stated, "The hormones produced during acute stress are meant to alarm you and key up for peak-accomplishments. They tend to combat sleep and to promote alertness during short periods of exertion; they are not meant to be used all day long. If too much of these hormones is circulating in your blood, they will keep you awake, just as a tablet of ephedrine would (incidentally, ephedrine is related to adrenaline). Your insomnia has a chemical basis, which cannot easily be talked away after it has developed; and at night in bed it is too late to prevent it from developing."

How to Sleep Well

The most important point is to recognise the factor that is causing mental tension and stress and to solve that so far as possible. In this regard smaller mental stresses are as important as the larger ones. These vary from case to case; like discord between the husband and the wife, disturbing relations, overawing boss, economic insecurity, or a habit of taking too seriously day-to-day problems. Talking aloud about these problems with people who listen sympathetically is helpful. In serious cases, help of a psychiatrist may be necessary. This should be coupled with the will of the patient to get out of the situation causing mental stress.

Some sleep better when they take physical exercise in the evening. This may be in the form of a brisk walk, playing tennis, badminton, or any other game, or gardening, swimming, etc. In the process one should not tire out oneself physically, as this may bring on a sleep of exhaustion, which is broken as soon as the exhaustion is over.

Regular habits, including that of sleeping at regular hours, are very necessary. One often experiences loss of sleep afterwards when the regular hour of sleep passes away in some other activity, as for example, seeing a picture or attending a party.

Indulging in some idle activity before going to bed is also conduoive to sleep. In the case of ladies, it may be cleaning face and feet, brushing hair or reading an article. Only light reading is recommended at bed time; serious reading or the one that is too gripping may take away sleep.

Some people find taking a bath before going to bed quite relaxing. So do some people find taking a glass of warm milk. Tea or coffee should never be taken immediately before bed time.

Environment of the bedroom is also important. There should be no disturbing noise, as for example, of the traffic outside, from a blasting loudspeaker or radio. or human voices. Glaring uncovered lights are also disturbing and they should be avoided. If the disturbance is from somebody sleeping in the same room, as for example, somebody who snores constantly, it must be taken care of.

After taking into consideration all the points mentioned above, one should try to relax physically, relaxing all the muscles intentionally including those of the jaw. Then one should intentionally try to think of pleasant things.

One should not panic if one does not get sleep soon; lying down with the muscles relaxed in itself does good to the body and gradually lulls one into sleep.

Sleeping Pills

Scientists have observed that sleep obtained through

taking pills is not of the same quality as one normally gets. It lacks appreciably in the rapid eye-ball-movement phase which is said to relax and energise the body maximally. The volunteers who had been stopped from sleeping, when allowed to do so, have a maximum increase of the rotatory eye-ball-movement phase of sleep. With pills, one does not get into this phase; they just knock one down to unconsciousness.

Furthermore, barbiturates and the allied drugs cause addiction. More and more of them is needed as time passes, and dependence on them becomes a habit. They should only be taken on the advice of the doctor, say, for example, by a person who has not slept well for weeks and is in danger of having a complete nervous breakdown.

Some people have afternoon naps. They find it very refreshing and feel full of extra energy for the work to be done in the late afternoon and the evening. Jolly well for them. These naps, however, should not be taken at the cost of regular sleep during the night.

Table 4

Sleeping Aids*

1. Eat moderately.
2. Do not drink late night coffee.
3. Drink a warm glass of milk.
4. Empty the bladder before going to bed.
5. Arrange the bedroom for quiet and comfort.
6. Resolve the grudge before retiring.
7. Exercise moderately in the evening.
8. Take a warm bath.
9. Try self-hypnosis, meditation or "counting sheep".
10. Pick a comfortable bed—one that is not too soft.

*Morse and Furst, 1979.

8

HEADACHE AND MENTAL TENSION

Whether it is piercing or pounding, throbbing or splitting, dull pain encircling the whole head, or the migrainous on one side only, recent researches have shown that in 90 per cent of the cases headache is basically due to mental tension or stress.

Mental tension may cause headache directly. In a study, patients getting headaches more frequently were asked to write down all the probable situations at different times that brought on the attack. It was found out that all these had a common denominator: unpleasant situation to face. This was confirmed when these patients were faced with an unpleasant situation not mentioned by them. It duly brought on an attack of headache.

Mental stress can indirectly also cause headache through the agency of the spasm created in the muscles of the neck and the head. Driving and reading usually do not cause spasm of the muscles, but in people more inclined to mental stress, it does so. This has been recorded experimentally, as spasm in the muscles created by any factor can be measured accurately. In such people, the amount of muscle spasm produced was proportional to the severity of the headache that they got.

In a case of headache, it is not the brain that is involved; it is entirely insensitive to the sensations of pain. It is the structures around the brain, particularly the blood vessels, that are affected. Mental stress in some people leads to dilatation of the blood vessels which can sometimes be felt throbbing. In cases where muscle spasm is the intermediary factor, it is the constriction of the vessels with squeezing out of the blood from them that causes headache. We thus see that in one situation, it is the dilatation of vessels, while in the other, it is their constriction that leads to headache. This is indicative of the fact that still we know very little about the mechanism of the production of headache.

Then there is the migraine, the headache that effects one side of the head only. This, if severe, is accompanied with nausea, vomiting and even visual changes during the attack. Migraine is known to occur in people who by nature are intelligent, educated, compulsive, perfectionist, and ambitious—the type who are more prone to mental stress.

In order to help the patients who are prone to headache, there are two courses of action that can be taken: (1) short-term measures to provide relief from the attack, and (2) long-term measures to lessen the frequency and intensity of attacks, or ideally, to try that the patient gets rid of such attacks.

Care with Aspirin

In order to provide relief from headache, aspirin is still considered to be the drug of choice. How it achieves its results is not known with any certainty but it does help in the majority of the cases. The drawbacks in resorting to frequent taking of aspirin are: (1) stomach upsets

and ulcers that lead to minute haemorrhages from the stomach lining, (2) consequent loss of blood, and anaemia, (3) the sensitivity to aspirin wherein the patients may get symptoms akin to asthma, or may get urticarial rashes.

When aspirin has to be taken, it should be taken crushed with milk, and not with water and it should not be taken on an empty stomach, as it is liable to upset the stomach very much.

It has been found that an analgesic like aspirin if given along with a sedative or a tranquillizer, provides better relief in a larger percentage of cases. So a combination of them can be given in order to relieve headache, but this should be done only on the advice of a doctor.

Those who suffer frequent headache, themselves know as to what provides relief. To one it may be massage of the head and neck, which by lessening spasm of the muscles, gives relief from headache. In another it may be a tight bandage around the head. An application of a counter-irritant balm may help. A cup of hot milk, tea or coffee may serve equally well. Rest is the most important thing and in many patients that is the only thing which provides relief.

As part of the long-term measure, the patient can be asked to note down all the factors or situations which he or she thinks bring on headache. Here also, some people may come up with the observation that they get headache after seeing a picture, after taking alcohol, constant exposure to an uncovered light while reading, or after plain hunger. All these situations may only be the accompanying factors of a stressful situation which needs to be dealt with.

Patients who occasionally get headache are advised not to expect perfection in everything from people around them. They should accept things, and not be bogged down by needless mental tension in day-to-day living.

Frequent headache in a person is a signal, telling him that he must mend his mental stress-producing habits, which if not done, may lead to more damaging diseases later on.

9

FATIGUE, EXHAUSTION AND MENTAL TENSION

A shop-assistant, who usually worked from 10 a.m. to 6 p.m. attending on customers cheerfully and enthusiastically throughout the day, once had an argument with the manager of the firm at 11-30 a.m. The fault which the manager attributed to him, the shop-assistant did not feel, was justified. But instead of listening to him, the manager asked him to shut up or quit the job. The shop-assistant got rebuked before the customers and his colleagues, but knowing that he had no choice, he swallowed the insult and kept quiet. He resumed attending on the customer he was dealing with. However, after he had finished with him, he found that he could not even stand at the counter. His legs trembled, there was perspiration on his forehead, his tongue and mouth went dry, and had he not sat down, he would have fallen.

His feeling of sudden tiredness and exhaustion precipitated by the event that caused him mental tension and stress, lasted throughout the day.

Such situations are by no means uncommon in day-to-day life, be it a housewife who suddenly finds herself drained of all the energy after she has managed her child, met with an accident, or a student who loses a

race and finds himself utterly tired and exhausted, which otherwise he would not have, had he won the race even after a peak of physical exertion.

When the feeling of tiredness and exhaustion after a spell of mental tension and stress is a single isolated episode, one comes out of it soon, may be within 24 hours. But if it happens repeatedly, then the person may perpetually feel fatigued and tired.

Take the case of a well-educated wife whose husband would come home late every evening half-drunk and would get fully drunk during the rest of the evening at home. She bore the ugly remarks of the neighbours about her husband and also the remarks of her husband who talked nonsense when drunk. She constantly felt tired, exhausted and could not even do the usual household chores without having to sit down many times in between. She was tired even early in the morning when she got up and before she had started doing any work.

Prolonged mental tension invariably gives rise to a feeling of physical exhaustion. This, in fact, is one of the first symptoms of mental stress, a protective reaction which signals that because of the emotional stress, the body is going to enter into a phase where various diseases are going to surround and pounce upon it.

Physiological Basis

What is the physiological basis for the body to feel exhausted after an episode of mental stress or a phase of continual stress?

When we do some physical work, the extra energy expended in doing it is provided by the sugar-glucose present in our blood. When this is used up, it is replenished with glycogen present in the liver and the muscles. Glycogen is normally broken down to glucose with

the help of adrenaline which is poured out by the adrenal glands. This adrenaline is not made available in adequate quantities to a man who, when confronted with a challenging situation, prefers mental stress to taking a fight or flight.

In animals and even in human beings living in primitive societies, a challenge elicits a fight or flight, and in both the situations adrenaline and other hormones are produced by the adrenals and other glands so that the body is able to perform the action desired of it.

The body of a civilised man is equipped with the above mechanism but he prefers not to use them because of the social traditions or of the danger of the consequences that would follow. He or she may be irritated or offended, yet would not like to express resentment physically. The result is that the adrenaline-producing mechanism is held in abeyance so that the body feels it in terms of physical exhaustion and tiredness.

Mental tension is at the root of the feeling of exhaustion and tiredness in about 80 per cent of the cases. In others the case may be organic, as for example, anaemia, or some other chronic disease. Such cases can, however, be easily sorted out by the doctor.

The important thing is to recognise the cause that gives rise to mental tension and anxiety and then try to deal with it. Half-way measures such as taking coffee or tea more frequently only delay the onset of fatigue. Pep-up pills also come in the same category; taken more frequently, they upset the body, further decreasing appetite or sleep or both.

10

FAMILY CONFLICTS AND TENSION

At the completion of the wedding ceremonies, the priest tells the couple, 'Now you have become one, body and soul.'

The priest ought to be more explicit in what he says. Because what he actually means is the possibility of becoming one rather than of having become one.

To become united body and soul, it takes efforts, understanding and adjustments. Wherever they are not forthcoming in equal measure from both the husband and the wife, there arise, instead, conflict and tension and the danger of throwing them apart.

If the husband and the wife come from different cultural and financial backgrounds, more of adjustment is required immediately after the marriage. If the wife comes from a family where money has never been a problem, to a family where money has to be budgeted according to the set priorities, conflict and resentment is bound to arise. If the wife spends on an item which the husband feels was not essential, and if later in the month it necessitates a cut in some other essential item, it is bound to lead to trouble.

Joint Family System

If the couple lives with the family of the husband, the chances of conflict and tension increase. Here probably, the resources of all the members of the family are expected to be pooled together and the spending done according to the needs of the individual, rather than on the basis of what one earns. This, coupled with the fact that everything in the house is done according to the dictates of the husband's parents, occasionally creates situations where everyone feels suffocated. Then, there are the proverbial daughter-in-law and mother-in-law skirmishes. In some places, an added difficulty is about not enough space and privacy being available to the couple. Such a set-up generates more sparks, more heat and more tension.

Birth of the first child is an event that puts some restraints upon the husband, which usually not many are prepared to bear. He has to live with the 'third person' in between him and his wife. His wife would now have lesser time at her disposal to attend to his needs. This may annoy him further. Yet it is not such a situation that cannot be corrected. A little frank discussion and better understanding between the two can tide them over this period.

Among some couples, conflict arises over how the children ought to be brought up. The wife may insist on one set of rules and the husband on another. While strict harmony may not be possible, some sort of an understanding should be arrived at so that the children do not feel lost, or that they do not take the dubious advantage of getting indisciplined.

Over-demanding Wife

A housewife, many a time, does not realise what her husband goes through daily in his office or business. While he may feel harassed by his colleagues, superiors, or juniors, or by the income-tax people, the competitors or due to monetary losses or insecurities, the wife expects him to be all cheerful as soon as he comes home. In fact, even while he has not changed his gear, she may pour forth before him all her imaginary or real difficulties she had to face during the day in connection with the children or the neighbours. She may even expect him to take her out and entertain her because she has been confined within the house the whole day. Where this becomes a regular habit, naturally, the man either shows resentment, or, worse, harbours ill-will and mental tension.

On the other hand, a husband must also realise that looking after the house, the children and his own needs is a whole time job for the wife, which, at times, may be quite demanding and monotonous as well. He must be appreciative of that and must say it in so many words. Burden becomes less if there is somebody who can appreciate its immensity. This must be taken care of by the wife as well as the husband.

Matter of Sex

A major source of tension between the husband and the wife is a subject which people do not like to discuss, but which is perhaps more important than any other. This is the problem of maladjustment between the two in the matter of sex.

Man and woman behave differently in matters of sex. While man feels the urge more often, that is not

the case with the woman. A woman may feel excited only when she is mentally inclined towards it. With the husband, this is not the case. A woman feels different when she has menses, when she is pregnant, or when she is feeding her child. It is not very easy for a man to understand this. Many a time, he may feel rebuffed or let down. The husband, however, must realise these biological differences.

Instead, in our country, a female child is, tacitly and indirectly but firmly, told by the parents and the society that sex is a taboo. Habits and notions acquired from childhood persist even during married life. These create a lot of conflict, confusion and tension among them. The husband feels more aggrieved and he may unintentionally take it out in matters not connected with sex.

Third-party Interference

While occasional conflicts arise between every wife and husband, howsoever well-adjusted they may be, if in such conflicts a third-party is brought in, then these conflicts take a wrong hue. If the wife talks about these conflicts with her parents or the husband with his, more often than not, the third party, in order to maintain his or her importance, wittingly or unwittingly derives pleasure in maintaining the conflict rather than in solving it. Moreover, when a third party intervenes, elements extraneous to the issue such as, face-saving and prestige, enter into the picture and that hardens the attitudes of both the parties. This ought to be avoided. None should be allowed to come between the husband and thewife; the children and the relations have their own proper places.

Most of the day-to-day conflicts between the wife and the husband disappear if they talk over the things rather than harbour them deep in their minds. Talking, discussing, convincing or thus getting convinced, creates better understanding. One cannot keep one's irritations hidden, they have a tendency to show up.

And when the irritations show up and lead to a conflict, it is very damaging to the mental health of the children if they occur in the presence of the children. It is worse, if they are made to take sides.

Personal Charm

After their marriage, many women get so busy with children and the household work that they forget that it is important for them to look attractive and desirable to their husbands. They become careless about their clothes and their own figures. Any husband would like and would be more responsive to a charming wife who welcomes him in the evening in a clean and well-kept house.

It is characteristic of pleasure: you give it and it comes back to you increased manifold. Both the husband and the wife would do well to keep it in mind.

11

THE EVENT OF BEREAVEMENT

The greatest misfortune for a father is said to be to give a shoulder to the pyre of his son. Loss of a dear one is the most irreparable and tragic event. It leaves the surviving relations stunned and lost. And yet it is an event which most have to face and bear.

Scientists have studied bereavement in the lives of many mourners, with a view to understand it and then to evolve out ways and means to provide guidelines and help wherever needed. The following are the recognized components of a bereavement.

Components of Bereavement

Shock is usually the first response of bereavement. It takes the form of physical pain, numbness, complete apathy and withdrawal, or an abnormal calm. The form and duration of this stage is often an indicator of how the person will cope with the event later on.

Denial of the event is part of the initial reactions. It takes the form of behaving as if the loved one were still there and no loss had occurred.

As the denial breaks down, the person experiences the despair, the emptiness, and the pain of the loss. This may or may not be accompanied by emotional release such as crying; if a person can cry, it usually

helps to ease the stress. As with denial, depressive outbursts occur throughout the whole process, but usually diminish in frequency, intensity, and duration as time passes.

The person may experience guilt for real or imagined negligence or harm inflicted on the lost person. The person often blames himself for not having expressed more love while the lost one was there, or for having been the cause of the loss.

Anxiety, sometimes leading to panic reactions, occurs as the full realization of the loss begins to come through—anxiety for the changes that will have to take place, for the loneliness looming ahead, for the increased responsibilities that the loss entails. Many people fear that they are abnormal because they have never before experienced the waves of savage feelings that overwhelm them and over which they have no control; some begin to seriously doubt their sanity.

There is aggression against those who could not prevent the loss, or who caused it, against family members who did the wrong thing or who omitted doing the right thing, and finally in the later stages aggression against the lost one for the pain and upheaval that has resulted from the loss.

Regression of Symptoms

In 1976, Blanchard and his colleagues collected data retrospectively on a volunteer sample of widowed women. They reported on the patterns of abatement of depressive symptoms in 30 highly educated women whose average age at the time of their husband's death was 30 years and who had been widowed an average of 7 years at the time of study. The widows were asked to state the frequency and severity of the symptoms

thought to be associated with depression at three periods following their husband's deaths: a few weeks later, one year later and at the time of interview.

The authors found that crying, appetite and weight loss, fatigue, sleep disturbance, loss of interest, poor memory, difficulty in concentrating, decreased speed of thinking, irritability, death thoughts, visions of the husband, and hearing the husband's voice had all significantly decreased by the end of the first year. Symptoms that had not subsided within the first year were depressed mood, restlessness, dreams of the spouse, helplessness and worthlessness.

Table 5

Frequency of Depressive Symptoms at 1 and 13 months

Symptoms	*1 month* %	*13 months* %
Crying	89	33
Sleep disturbance	76	48
Low mood	75	42
Loss of appetite	51	16
Fatigue	44	30
Poor memory	41	23
Loss of interest	40	23
Difficulty in concentrating	36	16
Weight loss of 2 kgs. or more	36	20
Feeling guilty	31	12
Restlessness	48	45
Reverse diurnal variation	26	22

Irritability	24	20
Feels like someone blaming	22	22
Diurnal variation	17	10
Death wishes	16	12
Feeling hopeless	14	12
Hallucinations	12	9
Suicidal thoughts	5	3
Fear of losing mind	3	4
Suicide attempts	0	0
Feeling worthless	6	11
Feels angry about death	13	22
Depressive syndrome	42	16

Table 6

Frequency of Physical Symptoms and Treatment at 1 and 13 Months

Symptoms	*1 month* %	*13 months* %
Headaches	26	19
Dysmenorrhoea	33	10
Other pains	31	30
Urinary frequency	20	18
Constipation	20	18
Dyspnoea	19	16
Abdominal pain	17	16
Blurred vision	15	15
Anxiety attacks	10	7
Alcohol use	11	19
Use of tranquillizers	39	31
Use of sleeping medicines	21	21
Physician visits	41	52
Hospitalizations	3	19

Coping with Bereavement

There is reasonable agreement that grief must be worked through; if it is not, the person will continue to have troubles of some sort. According to psychiatrist Hodge (1972): "The problem must be brought into the open and confronted, no matter how unpleasant it may be for the patient. *The grief work must be done.* There is no healthy escape from this. We might even add that the grief work *will* be done. Sooner or later, correctly or incorrectly, or incompletely, in a clear or distorted manner, *it will be done.* People have a natural protective tendency to avoid the unpleasantness of the grief work, but it is necessary and the more actively it is done the shorter will be the period of grief. If the grief work is not actively pursued, the process may be fixated, or aborted or delayed, with the patient feeling that he may have escaped it. However, almost certainly a distorted form of the grief work will appear at some time in the future."

Grief is a normal reaction to a loss, and most people deal with it in their own way and in their own time.

Some tend to shut themselves off from contact with others and, like a stricken animal, stay in isolation until the wounds have healed. Others constantly seek solace and support from family, friends, the general practitioner, the priest and even strangers to talk through the pain and anguish. Most people fluctuate between a need for company and need for solitude.

Family and friends can usually help by being available, while not imposing their presence on the grieving person. The important thing is that the person needs time—time to allow the intense emotional

response to extinguish, time to relinquish the lost object, or time to learn that he is not completely helpless in controlling those elements of his life that relieve suffering, bring gratification or provide nurture.

Apart from possible therapy of a supportive nature or medication to diminish the stress of the grief reaction a psychotherapist cannot help much in most cases.

Freud, near the end of his life, was consulted for treatment by a woman who had become depressed following the death of her husband. After listening to her, Freud quietly said: "Madam, you have no neurosis; you have a misfortune."

There is an anecdote in the Buddhist literature. Buddha went to a village where he was met by a young woman who had lost her husband. She was in terrible grief. Buddha heard about her and went to her house. She duly received him and then prepared and offered him something to eat. Buddha told her that he would eat only the things which had been prepared in a household where no death had ever occurred. She went from house to house and village to village but found no such household. She came back to Buddha and told him so. Then Buddha told her about the inevitability of death, the meaning of which she was now able to grasp. She felt solaced and calmed down.

12

CHILDREN AND MENTAL TENSION

In the fast-moving world of today, the norms and values of the older generation do not find favour with the younger one. In the home, when children behave in a way different from what their parents expect them to do, it creates conflict and mental tension.

Parents want to know as to how they should bring up their children so that when they grow up, they become a source of joy and peace rather than of conflict and tension.

In my view, the question is not so much how the parents should bring up their children; it is how the parents should bring up *themselves*. How the parents should behave and what they themselves should do, is more important. It is this that will guide the children in what they ought to do.

It is with this point of view that I am stating below some suggestions set out by experts in the field.

Some Suggestions

Set example yourself of what you intend your child to do. If you want him to tell the truth, you will certainly avoid a situation something like this: 'Dear, tell the person on the telephone that I am not in the house.'

If you do not intend your child to see a particular movie on the television, better you too do not see it and switch off the instrument.

Let your child feel that you trust him. If you look suspicious at what he says, then he will not come upto your expectations.

Find time to talk to your child. I have heard some parents say, 'I have sent my children to the best school. I am spending a fortune on them. What more can I do?' Whether the children go to the best schools or not, if the parents do not find time to discuss matters of daily interest with them, then one day they would find that what the children should be telling their parents, they are hiding from them.

Parents must find time to sit and talk to their children. This may be about their school, friends, or discussion on some point which the child wants clarified. Having more family activities with children participating, is helpful.

When discussing school activities with children, the parents must see that they speak reverently about their teachers. Never the teacher should be ridiculed before the child, otherwise, the latter would lose respect for her and also for her authority and the authority in general.

More often, if a child does something wrong, he needs to be explained and not punished. I have witnessed some young children, after they have been punished, asking their mothers as to why they got spanking. Older children sometimes do need punishing, but it should never be delivered in anger or rage. The idea of punishment is not to take revenge, but to make the child understand that he should not repeat that for which he was punished. Older children can be punished by with-

drawal of certain privileges for a duration rather than inflicting bodily punishment.

If there is full accord, understanding and love between the parents, the children feel very secure. On the other hand, if the parents quarrel frequently, the children feel insecure. A feeling of insecurity in a child makes him abnormal.

Furthermore, if there is no accord between the parents, the child exploits this situation. He may start asking for undue favours from one parent which may lead to tension in the family.

If a mother has one view of things, and the father has another, the child becomes puzzled as to whom to follow or which is right. Thus, as far as posssible, both the parents should present one joint team before the children for the sake of the children and the well-being of the family.

Some parents have the tendency to feel that their child is innocent and there are other children nearby who are spoiling him, while the whole neighbourhood feels the other way round. In such situations, the parents must try to examine objectively others' view.

Inside the house, the parents should avoid comparing their children among themselves. Each child has his own qualities; if one child has one particular good point, the other may have another. If you always compare a child who is good at studies with the one who is not as good, the latter will develop an inferiority complex, and may even start hating his brother.

Furthermore, let him decide himself as to what he wants to do in life. He may have special inclination and capabilities in a particular direction. I have seen many otherwise talented children wasting their time by taking up science subjects on the insistence of the parents,

while their own inclination was towards arts or crafts.

Be a parent with the child and let him choose and go with his own friends. Give him clear and unambiguous instructions and then stick to them. But do not try to put yourself in the place where his friends should be. I know of a girl who hates her mother because the latter insists that the former go to picture with her and not with her girl friends. Let the child learn, understand, compete and rival with children of the same age group, rather than be dominated in the company of a parent.

A new set of problems arise when the children grow up. This frequently involves the matter of friendship with the opposite sex and their marriage.

So far as sex life is concerned, one thing should be clearly understood by the parents. The modern times have imposed a greater burden on the young generation. Previously, the parents got their children married very soon; a boy at the age of 20, and a girl after the age of 14 or 15. But now, the boy can marry only after he finds himself in a position to support himself financially. This means after he has had an adequate education and has got a job. This is what the parents of a girl expect of their son-in-law-to-be. The result is that now-a-days the boys and the girls do not marry for as long as 10 years—if not more—after they become sexually mature. Previously, a married woman of 25 had by then four or five children but now, a girl of this age may remain a bachelor and few eyebrows would be raised.

The children now-a-days need to be educated properly in the matter of reproduction and sex. They need to be informed about the anatomy and physiology of reproduction in as simple terms as possible, taking the examples of the pet animals like a cat or a dog. It is

wrong to evade the questions from children by telling them. 'You were brought in by a stark.'

Proper and correct information and winning their confidence forms the basis of future caution and advice in the matter of sex.

Table 7

Childhood Predictors of Adult Anti-Social Behaviour*

1. Adults who are diagnosable as having anti-social personality, had almost all been anti-social children; that is, anti-social personality rarely or never arose *de novo* in adulthood.
2. Despite strong correlations between childhood and adult behaviour, most highly anti-social children do not become highly anti-social adults; that is, while anti-social childhood behaviour may be a necessary condition for anti-social personality of adulthood, it is not a sufficient one.
3. The child's own behaviour is a better predictor of his adult behaviour than are his family characteristics or social status.
4. Family variables matter more for moderately than for severely anti-social children. Severely anti-social children are found to be at high risk, no matter how good or bad their environment, but moderately anti-social children with anti-social fathers are more likely to be highly anti-social adults than are others.
5. Social class of rearing is a remarkably unimportant variable. It adds nothing significant once the levels of child's and his parents' anti-social behaviour are

taken into account in predicting severe adult anti-social behaviour.

Children reared in a poor but conforming family who do not develop anti-social behaviour in childhood are not likely to show antisocial behaviour as adults.

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*Lee N. Robins, Washington University School of Medicine, St. Louis, Missouri, U.S.A., 1980.

13

TENSION IN MIDDLE-AGED FEMALE

'Doctor, please tell me what is wrong with me? I feel tense, irritable, and like crying. I forget things, and I have little energy left in me to do any work. Many a time during the day, I feel as if my whole body is hot suddenly; even my face becomes flushed and I feel very awkward if it happens before others. I do not sleep well at night; I keep awake for hours together. When I tell my husband, he says that it is only psychological.'

This patient was 42 years old and she had the complaints for the past six months. She had been a well-balanced educated woman, a housewife. Her two children were grown up, a girl of 18, and a boy of 16. Her husband, a businessman, had money enough and to spare.

I reassured this lady that the complaints which she had were fairly common in women of her age-group, and that they would disappear after a little while on their own; however, I could help her with some medicine to tide over this period. In order to allay her apprehensions, I explained to her the genesis of her symptoms.

At the time of puberty, pituitary, a small pea-nut sized gland inside the skull on the under-surface of the

brain, starts secreting a hormonal secretion called gonadotrophin which activates the two ovaries, the female sex glands in the abdomen. The ovaries, in turn, secrete a hormone called oestrogen. This sets in motion the process of adulthood. In one of the ovaries is produced a follicle, a bleb-like thing from which emerges a female egg or ovum. This process is called ovulation. The empty follicle now starts secreting another hormone called progesterone whose function is to prepare the uterus for pregnancy. In case the pregnancy does not occur, these preparations go waste and the temporary lining of the uterus is shed off in the form of menstruation. This cycle is repeated usually every 28 or 29 days till the ovaries become inactive again, produce no oestrogen or eggs, and menstruation stops. This happens in most of the women between the ages of forty and fifty.

When the ovaries stop secreting oestrogens, a lot of changes occur in the body. A new balance is to be setup among different hormonal secretions of the glands.

It is in this period when the old balance gives place to a new one that different and peculiar symptoms are produced in a majority of women. It is only a small percentage who escape it entirely. This, however, is a temporary phase. When the new balance gets set up, the symptoms disappear.

If a woman has rather severe symptoms she could be helped by taking, under the advice of her doctor, an hormonal preparation whose deficiency has occurred, namely, the female sex hormones called Stiboestrol or Ethynyl estradiol. They can help her by suppressing the symptoms.

Wrong Conception

Some women through wrong knowledge, pick up the notion that stoppage of menstruation is a signal that they would stop enjoying sexual life or that old age has set in them. This is all a myth. Stoppage of menstruation has no connection at all with enjoying sexual life; on the contrary, they can now do away with their anti-fertility pills or other contraceptive devices. Stoppage of reproduction opens up before them newer horizons. Now they can engage themselves in other creative activities without being inconvenienced by the monthly periods or the pregnancies. They can take up a career if they so choose.

In fact, it has been observed that women who are busy in some profession or career, feel the effect of this changeover much less than the housewives who have less of outside activities to keep their minds busy.

There can be other reasons as well to make a woman in this age-group feel tense and restless. When they see around them another generation of youth, they feel as if their time is over.

Charm versus Beauty

Younger people do have the beauty of their youth, but it is incomparable with the grace and mellowed charm that can only come with age—provided one knows how to grow up gracefully. Someone has rightly said that while beauty of youth is the work of God or Nature, the grace and charm of the old is a thing that only one can create oneself. One occasionally sees a beautiful daughter and her graceful mother together; the one who attracts the attention of the most, is the mother. I know of a girl who complained to her

mother that she would not like to go with her as she overshadowed her attraction.

To look graceful requires inner feelings, goodwill and the quality of giving rather than of taking. It certainly does not consist in dressing like youth in minis or hot pants or applying thick layers of make-up or sporting exotic hair-dos. They only make one look cheap. One must wear clothes and make-up which goes with one's age.

Some women feel unwanted, lost and hence restless when the children grow up. The latter do not need her help or they may even go out of the house. Husband keeping busy in his work and the children needing no attention, she feels left alone. Such a situation she does not relish, nor can anybody else.

The remedy is that she should prepare herself for such a situation even before it has occurred. A housewife can take up a career or a profession which she left when she got married. She can even do some social work. She can have more friends and acquaintances. The idea is to feel that she is needed, she is wanted and that she is not totally dispensable. If her children do not need her, there are many other situations where once she starts, her services can become indispensable.

Growing old in years brings in a period which needs adjustments. Once this is understood, life can become more satisfying than it was even in youth.

14

TENSION IN MIDDLE-AGED MALE

In every man's life, a stage comes when he asks of himself: "What am I doing? What have I achieved? What are my goals?"

In most men, this stage comes any time between the age of 40 and 50. This is a difficult stage and these are difficult questions.

In youth one starts with grandiose ideas: piling money, becoming seniormost officer in the department, creating a lasting image in the world, winning a Nobel Prize, etc.

But as the years slip by and one enters the forties, at moments, he assesses what he has achieved so far. At this stage, he can, with some reasonable degree of certainty, foresee also what more he can possibly achieve. He sees a huge gap between what he started with to achieve and what he could achieve.

Alongwith that come the telltale signs of advancing years: grey hair, expanding middle, a feeling of tiredness. On top of that, appears a new generation throwing up challenges to the competence of the older generation and threatening to throw them out or waiting the time when they would be thrown over.

This is a difficult situation for many, and many give way. They feel depressed, out of sorts, irritable and toss about in the bed at night.

Extroverts or Introverts

Some of them become extroverts. They start growing their sideburns and beards, wear bell-bottoms and gaudy shirts. They even start using perfumes. It is at this stage, that they may even start smoking and drinking if they were not doing before. Worse still, they might go after young girls. This all is to assure themselves that they still have the qualities of youth left.

Others, at this stage, may become introverts. They withdraw themselves like a tortoise withdrawing itself inside its shell when it senses danger. They think of maintaining the status quo; their only sphere of interest or emotions is the job, the wife and their children.

Both these groups aggravate their difficulties, anxieties and tensions. None can escape from this stage or period of life. One has to realise and understand that the aspirations of youth were more a dreamy wishful thinking; they were, in fact, over-estimates of one's capacities. If they have not been attained, they were not quite attainable under given conditions. One has to reconcile oneself to what one has achieved or what one can possibly achieve. The solution is neither fight nor flight, but just a realisation of the situation and adjusting oneself accordingly.

It is better to face the facts and limitations as they exist, rather than to fritter away one's energies in unproductive useless escapes.

If you are in such a situation, make a sincere and earnest assessment of the situation and do what your inner self tells you to do. Do what satisfies you. Do

what you always wanted to do. Do not think of what the family, the neighbours, the colleagues would say. Be yourself: no frauds, no ifs, no buts.

Besides that, be a little outgoing. Be more flexible in your habits and outlook. Criticise the others less. Try to look things from the other person's point of view. Be more giving rather than demanding.

One of the best ways of getting out of a feeling of depression at this age is to take a vacation and go out of the daily rut of work and drudgery. Not only would it provide you relaxation but also new ideas which may change the course of your life altogether. A vacation at this period of life is a must for physical and mental health and well-being.

Try to maintain your health and body. Physical exercise is a must at this period of life. Also use discretion in diet. Less food and a well-balanced one can keep one healthy and trimmed.

15

AGING WITHOUT TENSION

Aging was certainly fun for one of our neighbours, Mr. Gopal Dass. He was seventy-one years young. I call him young because there wasn't anything old about him except a good crop of snow-white hair on his head, which he kept covered with his white turban. He wore his turban inside his house too, even while he was not wearing shoes. He was president of the area welfare committee. He liked everybody and everybody liked him. To meet people and gossip with them was his hobby, and being a property-dealer, he combined business with pleasure. He enjoyed life even at this age. He liked good food and almost all his life he had overeaten. He had diabetes and once a minor brain stroke, too. On the insistence of his relations, he went to a doctor who advised him to reduce his weight by cutting down his diet. Mr. Gopal Dass did not like his advice, and so never went to him again.

Personally, I think he should have followed the advice of this doctor and I will tell you why.

Diet

A nutrition expert carried out an interesting experiment in his laboratory. He divided 300 newly weaned rats into three groups. To Group A rats, he gave a less

than average but an otherwise well-balanced diet. To Group B, he fed a very rich diet giving them as much as they could take. Group C rats were given diet similar to that of B group, but they were confined in specially built cages so that there was very little opportunity for them to move about much.

The results were startling. While Group A rats fed on less the average diet lived for more than 1,500 days, Group B rats who had rich diets lived for about a thousand days, and the rats in Group C who also had heavy diets but had restricted movement, survived only for 750 days.

These and similar experiments have proved conclusively that the nutritional pattern and mode of living are important factors that control the life span of an individual, even more than heredity does. Overeating and consequent increase in weight is one of the factors that lead to the development of coronary atherosclerosis, heart attack, high blood pressure, brain strokes, etc. Ill-health in later years due to these and many other diseases is not merely the result of growing old, but is due to the long-drawn dietary indiscretions of youth and middle age. Statistics gathered from insurance companies show that between the ages of forty and forty-five, over-weight begins to tell upon health. An excess of 12.5 kgs. for instance, lessens the expectation of life by 25 per cent and a further increase is even worse.

It is important to remember that this is entirely preventable, and for this, the first thing to do is to avoid overeating. What is important is not the amount of food eaten, but a well-balanced diet. Lean and wiry individuals are known to eat less but they keep physically fit till a very old age. While over-weight people

who reduce to the normal weight for their age, can have an almost normal life expectancy, it is easier to avoid putting on weight than to reduce it later. I am reminded of a nutrition expert who helped his patients reduce their weight by a technique he had learnt by experience. On enquiry, his patients would invariably tell him of the little food they took, in spite of which they were increasing in weight. He would note down carefully the diet which the patient said he usually took. Then he would call the nurse-in-charge and instruct her to admit the patient in the ward and put him or her on the same diet as mentioned by the patient. All his patients lost 10-20 kgs. of weight in three weeks on that very diet! This proves clearly that one can overeat without being aware of doing so.

Physical Exercise

The role of physical exercise in maintaining good health is equally important. Like the rats in Group C of the experiment, people who do little physical exercise await the same fate. In our sedentary civilization, a person generally confined to a chair in the office possesses a heart in his thirties which should normally belong to one in his fifties. From our point of view, the significant observation is that regular exercise can restore such hearts to a near-normal condition.

Mental Health

While physical exercise is necessary to enjoy the growing year after year, this in itself is not enough. One needs to remain active and mentally alert as well. There is no truth in the statement that mental powers normally decline as one grows older. Such an impression in the past was created by comparing the mental

performance of twenty-year olds with those in the fifty-year group. This naturally gave inaccurate results because twenty-year olds were more educated and informed because of the better facilities available to them than were available to those in their fifties when they were young. More recent follow-up studies of the same individuals at the ages twenty and fifty-five have shown that mental alertness and receptivity generally increases with age. Mental sluggishness, on the other hand, is the outcome of the continual rusting of unused faculties.

Examples of elderly people who take courses of study and do extremely well are seen increasingly at university convocations. Such people are really too busy to let their minds grow old. They defy the ravages of time and stay young despite the wrinkles on their faces.

Multiple Interests

Old age is no bar to enjoying and finding satisfaction in life and also in being a useful citizen. But for this one must cultivate interests in activities which give pleasure and satisfaction. A person need not follow only one profession or a way of life throughout his life. A teacher need not remain a teacher always, a doctor remain a doctor and a businessman or a shopkeeper remain in his restricted environment. A doctor who is a bit of an artist, or a businessman with an interest in scientific subjects, would be a greater asset to society. With some people two or more interests or professions go very well indeed. Such interests are challenging, and taken up in moderation, go a long way in keeping one mentally active, so when one retires one does not feel

lost, but in fact is relieved, and can pursue other activities.

For Old Grandparents

Now a few words about those who are in the still older age groups, the grand-parents. Experience has shown that if they keep themselves busy with regular work, they find life more satisfying and thus they are a source of comfort and joy to others as well. I knew an old man in our village who had been a farmer. But now he was not equal to the hard exertion of farming and his children had taken over. The old man could not sit idle. In his youth, he had learnt the job of a carpenter. Now he would go to people's houses in the village and mend their *charpoys* free. If on some day nobody needed his help, he would sit under a tree and make little playthings and distribute them among the children. They loved to collect around him and request him to make something for them.

My own grandfather used to keep a little shop but in later years, he retired from this work. In his early life, he had learnt to make a special kind of ointment for boils, which was known to be very useful in the days when the modern drugs were not known. I remember him smearing the ointment on a small piece of round cloth and applying it to the boils of the young and the old. He would do this in the mornings and rest in the evenings. His total expenditure per month was only five rupees. But this petty sum and the time and labour well spent gave him great satisfaction right upto old age.

One study showed that active people generally had more self-esteem and a better outlook on the future.

People with different interests can do the same. A retired teacher, a lawyer, or a doctor and others can help people around them by rousing or maintaining their interest in various matters and thus promote their zest for living. It is unhealthy for an old man to curb his interests and be a bore to himself and others. He should still have widening interests, just like a river which starts as a rivulet and grows larger and wider as it goes ahead towards the sea.

Table 8

Aging Phenomena

Biological

1. Increase in collagen and calcium in the tissues.
2. Decreased elasticity of blood vessels and lungs.
3. Decrease in cells, especially neural (brain) cells.
4. Increase in fat deposits.
5. Decrease in metabolism.
6. Decreased waste removal.
7. Decreased oxygen intake.
8. Decreased muscular strength.
9. Decreased activity of hormones.
10. Decreased function of immune system.
11. Thicker and less efficient heart, slower pulse rate and higher blood pressure.
12. Poorer circulation.
13. Decreased function of brain and nervous system.
14. Decreased function of kidneys and genital organs.
15. Decline in vision, hearing, taste, smell, touch, pressure, pain and speech.

Psychological

1. Memory loss for recent events; better recall for past events.
2. A self-assertive attitude.
3. Anxiety about death, disease, body changes, security, etc.
4. A turning inward.
5. Loneliness and isolation.
6. Conservatism.
7. Lack of energy.
8. Feeling of loss of attractiveness.
9. Trying to revert to younger behaviour.
10. Depression.
11. Emotional instability.
12. Carelessness in appearance.

Sociological

1. Loss of job.
2. Loss of family ties.
3. Loss of friends.
4. Economic instability.
5. Loss of power and status.
6. Loss of respect by others.

Modified from Morse and Furst, 1979.

16

RETIREMENT DISEASE

R.L. retired as a Section Officer from a Ministry at the age of 58 years. He was well-built, well-nourished and in good health, though a little obese. He had saved some money and had purchased a plot of land through a housing society. He thought it fit to get commuted his pension, which was readily done because he was in good health. Till he could build his own house, he rented a two-bed room portion in a house in a locality near to the Government flat that he was occupying before. The new accommodation was smaller than the one he was occupying before and the neighbourhood was also less sophisticated.

Since R.L. was still in very good health, physically and mentally, he wanted to get a job to supplement his income as well as to keep himself busy. He enquired from his friends, relatives and acquaintances. He got a job as an accountant with a business firm, but the place of work was quite far away from his house and he reached there after changing two buses on the way, which in itself was exhausting. The proprietor offered him Rs. 600 per month as salary which was much below his expectation and experience. R.L. had to agree to it, because no one was offering him anything better. The work load was heavy and R.L. was asked to stick to the

hours of work. He worked hard—harder than he had at any time worked in the Government office. He had no choice but to keep working.

In his home, in spite of the efforts of his wife, the monthly expenditure could not be cut down, and R.L. was hard put to balance the budget. His son was not well inclined to studies, and R.L. had thought to fix him in a small business. But the young man was neither good in studies nor in business. As a result, there were losses in business to the tune of half of what money R.L. possessed.

What with hard work in his office, the worry and anxiety about the losses incurred by the son in business, R.L. lost his weight. His trousers became too baggy. He looked old and developed a look of bewilderment.

Financial stringency was only one of the features of R.L.'s retirement. He who till lately acting a peak role of his life, suddenly found that his experience and abilities were no longer required or appreciated.

His situation in his home also changed. He did not get as much care and attention as he used to get while in service. And sometimes, he was asked to do jobs which he used to order other members of the family to do for him. In his interaction with members of the family and relatives, his views got lesser weightage or even his feelings were not cared about.

Since he and his family changed to a new residential accommodation, in the new environments he was treated as an old, retired person, of scarce means, and certainly not with the respects and regards he used to have before.

Within a pace of three years, R.L. not only got degraded in the eyes of others, but even in his own eyes. With retirement, he lost his own original identity. This

told on his physical health and within a short time of three years, he became old, haggard and squeezed out of physical and mental energies.

Examples like these are abundantly seen around us. Retirement as an event and a process, is a complex multi-dimensional transition involving many possible changes: loss of income, loss of work role, changes in daily activities, changes in social interaction, residential and geographical mobility, changes in self-concept and public identity and so on.

In our environments in India, many a retired man get physically ill and prematurely senile soon after retirement. This leads to so many psychosomatic illnesses that it has been called "Retirement Disease" by Selye.

The financial stringency that retirement brings can hardly be helped. There are more people available than the jobs, and the capabilities and work of a retired person get a raw deal in the open market. The only way to face economic hardship is to make arrangements about it when one is in service and try to save more.

But other aspects of retirement one should be able to manage, to a large extent. There are some people—only some—who look forward to retirement so that they can devote more time to their interests in finer things in life or whatever they always wanted to do, such as writing, reading, appreciation of different arts.

Hobbies inculcated in youth are one's real companions when one retires and grows older. They keep one busy physically and mentally.

As one retires and grows old, one does learn—but one should learn even more—to give rather than take. Giving time is one thing that retired people should be able to do in plenty. Social service of any type would keep one young, occupied and healthy.

17

YOUR JOB AND MENTAL TENSION

Mental tension can as much arise in a person at home as in the place where he or she works. While more work has been done and attention given to the tension that arises at home, that is not the case with the latter. Whether the person has a proper place and environment whether he gets job-satisfaction or not, whether he is properly understood by his seniors, whether he gets along well with his juniors, is there an extra burden on his physical or mental capabilities, all these are important questions having a bearing on the physical and mental health of the person.

Not only that. If he is not satisfied, there is a likelihood that his anxiety and tension gets reflected on to others, leading to all round frustrations, inefficiency, slow-down strikes and destructiveness.

The following are some of the examples of the situations which cause mental stress.

Case 1

Miss D, 35, who had been a lively and contented woman with a reasonably good health, complained of irritability and difficulty in getting sleep for the past six months. Going through her history, the doctor

found that she had been in-charge of a section of a library. She had a staff of ten people working under her. The senior librarian was so much satisfied with her work that he had left the things to her entirely.

She had already put in over ten years of service and was now feeling that she had developed skill and confidence to be promoted to a higher post. But this was not forthcoming.

In this situation of dissatisfaction, she had unintentionally started taking leave for minor disorders as well, and when this came to the attention of the librarian, he called her in order to find out what was wrong. He saw the situation clearly, and this lady got a promotion that she deserved. Within days of it, she became her normal self again. Her insomnia and irritability disappeared.

Case 2

Mr. A was an assistant-manager in a large firm. He was efficient and popular. He was promoted as a manager, and now he had under him a staff numbering 200 and the welfare of the whole firm. A few weeks after the promotion, he started getting fits of palpitation and would keep awake at night for hours together.

In discussion with the doctor, it came out that he was not finding himself equal to the job of a manager. Hard decisions, effect of arguments with the staff members, his inability to carry his junior officers with him were telling upon his nerves. But he was not ready to admit that his symptoms were the result of all that. On the contrary, it had grown upon him that he had developed a physical ailment.

The situation was saved for everybody when he was asked to take leave, and in the meanwhile another person from outside was called in as a liaison officer,

who on the return of the manager took over much of the responsibilities that the Board felt was beyond the capacity of the latter. The manager lost symptoms of his disease.

Case 3

Dr. K. L. was trained as a nuclear scientist. He had worked in a laboratory as in-charge of a unit and had proved to be a successful research worker. He had to his credit some original work which was appreciated by the authorities. As there was no research post in the institute to which he could be promoted, he was promoted and sent out on to an administrative post.

It was at this time that instead of becoming and looking happy and satisfied, he became morose, uncommunicative and tense. He had never done any real administrative work and found that his juniors in the office were making a fool of him and making him take decisions which if he had known better, he would never do.

He took a hard decision. He put in an application that he wanted to be reverted to his previous post. His colleagues thought him to be a fool, but he regained in a short while his previous tranquillity and job-satisfaction.

Case 4

In a readymade garments factory, the rate of job-changing was so high that it irked the management. No sooner had a new entrant learnt the job, than he or she left it. Furthermore, the rate of breakage of the sewing machines and even accidents was fairly high which caused a huge loss of man-hours. The owner asked the advice of a factory-inspector, whose report revealed the following:

1. There was less space available to each worker than was needed.
2. Male and female workers worked in the same hall, a situation resented to by the female workers.
3. The canteen was a messy hole where all the workers had to sit huddled together during the lunch hour.
4. Toilets for male and female were situated adjacently, which the female workers resented.
5. If a worker was late even for 10 minutes, his one hour's pay was deducted from his wages.
6. The management did not give wages when they were expected to pay.

All these factors were telling upon the mental health of the workers, and as soon as they could pick up experience enough to go to another place, they availed of the opportunity.

The above case histories illustrate that job satisfaction for a worker is of utmost importance for his physical and mental health. It is no less important than the salary that a worker takes home.

18

NOISE AND TENSION

In India, since ancient times, there has been a tradition that those who want to have mental concentration or worship God for prolonged periods, go into the loneliness of the forests. There, away from human habitation and amidst the peace-giving sound of flowing water and melodious singing of birds, they find tranquillity of mind essential for concentration and meditation.

The things have changed now. Last summer, I went to out-of-the-way hills for a few days. One day, I went kilometres together inside the forests and sat there in a lonely, beautiful place. All at once, the tranquillity around was shattered by the jarring noise of a transistor radio tuned to Vividh Bharati proclaiming 'Mody Dhage, Mody Dhage'—a symbol of the clattering industrial invasion of our environment from which one cannot escape.

Inside the city, it is free-for-all. When people make a telephone call, it appears that they have no faith in the efficacy of the instrument.

Some young men on purpose remove the silencer from their scooter and go tearing away the atmosphere and the people's eardrums. You have to put your palms on the ears and yet you feel as if you have been hit to pieces.

Then there are the *jagrans* of the devotees, who earn for themselves nice things in this life and a place in the heavens after death, but take away from others hard-earned night's sleep.

Harmful Effects

Exposure to noise tells upon the health. Very loud noise of 150 decibles (a unit of sound), can cause a rash under the collar, in between the fingers and the thighs. Eardrums may get ruptured. It can cause giddiness and nausea.

Exposure to over 100 decibles for a few hours, lessens efficiency and makes one more prone to accidents. It makes one aggressive and quarrelsome. Even in those who are sleeping, exposure to loud noise causes a disturbance in their brain waves as recorded by the electroencephalogram.

Lately, a few other observations regarding the damaging effects of prolonged exposure to loud noise have been observed. It can lead to irregular or faster pulse beats, enlarged hearts and increase in blood cholesterol. It causes mental fatigue, irritability, and precipitates or aggravates mental tension and neurosis.

Most disturbing observation is that loud noise increases heart rate of the foetus inside the abdomen of a pregnant mother. This may cause irreparable damage to the unborn baby.

Noise is one of the pollutants of our environment. It is on the increase. Trucks, buses and cars on the road, the trains on their tracks, the jet aeroplanes in sky, they all are producing more and more of noise as their number is increasing. Haphazard growth of the cities, in spite of the efforts of the city planners, is bringing

small and large industries beside or inside the residential areas. The transistors, the radios, and the loudspeakers make their own contribution. Much noise comes from people as well, a vast majority of whom are not aware that by speaking loudly, they are being a nuisance.

Noise Control

If there is any doubt at all as to whether a noise hazard exists in a factory, the following questions might give the answer:

1. Do workers find it difficult to speak to one another in a noisy environment?
2. Have workers complained of head-noises or ringing in the ears after working for several hours?
3. Do workers exposed to the noise for several hours, experience temporary deafness?
4. Have workers been told by their families that they are going deaf?
5. Is the labour turnover in noisy workshop considered to be excessive?
6. Has management any suspicion that noise is affecting efficiency or output?
7. Have any complaints of excessive noise been received from adjoining residents?

Good mental and physical health requires that exposure to loud noise should be minimised on the roads, inside the factories, at construction sites and inside residential buildings.

Noise produced inside the factories is very harmful for the workers as they are continually exposed to it for years together. It is detrimental to the interests of the owners as well, as it lessens efficiency of the workers

and makes them accident-prone. For those who live around the factory, it is equally a nuisance.

It is the duty of the town-planners to segregate industrial from residential areas. If this is not done, there is not only the nuisance from noise but also from air-pollution.

Inside the houses, one can lessen noise by using carpets or rubber on the floor. Heavy curtains also lessen the propagation of noise. Fans and other electrical implements need care so that they make the least noise.

The most important thing is to make people aware that noise is bad for physical and mental health. Many people yet do not know it.

19

ROLE OF INFERIORITY COMPLEX

I know of a person who was considered to be a gentleman by one and all. He was polite and considerate within and outside his family.

This man met with a tumbling failure. Within a short while, it was noticed that he had started wearing gaudy clothes, grew a moustache and sideburns, became voluminous, aggressive and domineering in his behaviour inside and outside the family. This surprised his wife, neighbours and colleagues. He lost some friends and the respect of many.

This went on for four years when he gradually showed signs of returning to a behaviour pattern that he had all along his life. But this happened only after he had made up his previous losses and got pretty certain of good prospects in life.

Paradoxical Behaviour

Superficially, it seems, he threw up a paradoxical behaviour pattern: when he failed he became harsh and domineering; when he succeeded he turned polite and considerate. Yet this happens in people who develop an inferiority complex. In order to hide their own

embarrassment and deficiencies from others, they wear a cloak, a smoke-screen.

Many a time, it is difficult to judge people properly unless you have been with them for a longer time. While it is helpful to judge people from what they do rather than from what they say, yet even what they say is many a time quite revealing. A person having a scorn for rich people may be hiding his inability to make more money; a rich man calling artists good-for-nothing, may only be throwing a smoke-screen around his inner urge of having been an artist. The proverb, 'Grapes are sour' is not without its wide application.

Inferiority complex, generally speaking, takes birth out of frustration. The latter results when one is not willing to accept the reality. When the gap between the dreams and the reality is great, but the person is unwilling to accept his limitations, then he throws up a reaction—inferiority complex—which is meant to cover up his own deficiencies.

Such a person, on the surface, may look well-poised and may exude an air of self-assurance, yet deeper down, as someone has put it, 'he is not so much a human being as a civil war'.

Know Your Limitations

Every person is a bundle of strength and weaknesses. Even the strongest among us has limitations in certain directions. Some of them are hereditary, they have come with us within our chromosomes. We cannot change them. Let us duly accept this fact.

There are other limitations which our environments impose on us. We may be able to change them only slightly. Let us accept this fact also.

There is a third set of limitations which our previous experience and habits have imposed upon us. We can change them. We can grow out of them. We can enlarge ourselves with new experiences. This is a privilege that we have. We can utilise it as much as we like.

In our childhood and youth, we have many choices before us. But as we grow older, the choices lessen. If we want to go in one direction, we necessarily cannot go in the others. Let us decide first in which direction we want to go and then devote all our energies towards it. We have to decide what we want to do in life, and having decided that, follow the path which leads towards that.

On that path, there are scattered thorns, hurdles, obstructions, which we shall have to cross. Let us see that by our own actions we do not put in more hurdles. If there are other people going along that path, give help and get help, and see that by your own ill-conceived actions they do not become hurdles for you.

Accept Your Limitations

When you accept your obvious limitations, you break the chain of self-pity, discouragement, and frustration. I know of a father who did not do that. He had a daughter who was epileptic. He did everything for her but she still continued getting the fits. When she reached the age of marriage, he started looking for a boy for her to marry with. The doctors told him that in her condition she could not be married. But the father, not disclosing her disease to the bridegroom and his parents, got her married. After the marriage, when her husband came to know of her disease, he felt cheated and furious, and ultimately it led to divorce. The girl

and her father and the whole household were plunged into another misfortune besides the one they had before.

Acceptance of your limitations is the first step to becoming a real person. After acceptance comes the process of compensation. Your limitation can become an incentive to progress further in all the other directions except the one limited. A person shy by nature can take up a job of, for example, a research worker, where his limitation is not a hindrance but an asset. A plain girl can develop her wit and charm and may after some time start looking more charming than others gifted with better looks.

Accept your limitations and handicaps. Do not feel humiliated or discouraged by them. Then get to work in the directions best suited to your needs. That is the way to overcome inferiority complex and subsequent tension and worry.

20

NEIGHBOURS AND MENTAL TENSION

'In the morning when I went to my office, you were all right. What has happened that you are completely off-mood now?' asked Rakesh of Susheela, his wife. 'Ask me, what has not happened. Our neighbours have got a television set. Did you not see the antenna on their roof? I had been asking you to get television for us, but you never paid attention to it. You have lowered my prestige.'

Rakesh said, 'Look here, television was never a priority with us. We spend a handful of money on our children's education, we eat well, and we live well. What more can we ask for from God? We should be grateful to Him for what He has given us and should live contentedly.'

Susheela answered back, 'Our neighbour gets the same pay as you get. How is it that he can get a television and we cannot? Does he make money by some other means? If he does that, you must try to find that out and expose him.'

Rakesh said, 'It is not a question of his getting money by some unfair means. He was telling me that his father had contributed some money and some he had been trying to save over a year. His father is too

old to move about and he says that it is primarily for his entertainment that they have bought the television. By the way, while I was coming back, he had requested me that we all should go to his house and see the programme on the television.'

Susheela was not pacified. She said, 'If you like, you may go, I would not. This is just the way his wife wants to show that they are superior people, I won't go there to be insulted.'

Rakesh and Susheela did not go to their neighbours, however, their children went and enjoyed it.

Feeling of Jealousy

A man may have a home, possessions, a charming wife and loving children, and yet find all of these insipid simply because the neighbour has them in greater abundance.

A feeling of comparison naturally comes in when any two people are living adjacent to each other. But by converting this feeling into jealousy one only harms oneself. It works like slow poison or a sort of slow suicide, as it corrodes one over the years.

The neighbours know each other but they don't understand each other. They don't understand that what each one does is, perhaps, best suited to his own conditions, needs, and the way of thinking. Each one thinks the other either stupid or mean.

How neighbours live, or what they do is their concern. How you should live or do is yours. If you try to do what the neighbours are doing, you will never be able to do what you have to do according to your needs or conditions. Hence, you would always be lagging behind, always sour, always cursing others, and harming only your own mental and physical health.

Feeling of jealousy and mental tension is much more pronounced among the neighbouring housewives than among the husbands. They cannot do without meeting and they cannot but feel jealous. Even when they look like friends, that is just a cover. With their subtle manners and smart talks, they try to impress on the other the superiority—if nothing else—of the ideal and thoughts of their husbands, or the cleverness of their children or the recipes they know and cook, or the embroidery work on their sarees. In this, they are shrewder and subtler than even the best of diplomats.

Another source of tension among neighbours is too frequent borrowings of all sorts of things—from potatoes and onions to umbrellas and sewing machines. If it is a one-way traffic, it necessarily leads to ill-will which can neither be shown nor suppressed. Some neighbours who thus benefit, consider this to be the outcome of their cleverness. This, however, is never so.

Others borrow things and then forget to return or return them damaged. They never realise how they would feel if they are at the other end.

Help and Happiness

Neighbours can be a source of help and happiness rather than that of mental tension and jealousy. A friend of mine lost his father in another city just at the time when his children were having annual school examinations. When their neighbours came to know of their predicament, they went to my friend's house and expressing their condolences, one of them asked my friend's wife to sort out clothes, etc., for the children so that she could take them to her house. This was done. It took my friend about a week away from the city.

The children lived comfortably and appeared in their examinations unhindered.

One's relations, even when living in the same city, cannot be that helpful as could be the neighbours. The only thing is that it is a two-way traffic and one has to take care to develop and maintain it on those lines.

Positive Attitude

In order to achieve that, the most important thing is to refrain from peeping into the neighbour's house to see what is happening there. If you peep constantly you would know more about them. Then you would draw your inferences from what you know or what you saw. These inferences may be wide off the mark. Then you would be tempted to make suggestions—who does not—and these may be taken as undue interference. Interference in the internal affairs of neighbours as those of neighbouring countries is resented by all alike.

It has been observed that some people do not like their neighbours dropping in at all times or at odd times, uninvitedly. Too frequent visits mean too frequent exchange of views, knowing each other more thoroughly. Among neighbours—or for that matter among any two people—the faults come under focus sooner and more glaringly than the good points. In a majority of the cases, if you know a person from too close an angle, you tend to lose charm for him even if he is saintly in his habits. Even if you see a rose flower under the microscope, it would look anything but beautiful or worth appreciating! It is better to respect the privacy of the neighbours. The hedges in between the houses do serve a good purpose.

When dealing with neighbours, make this your yardstick: 'How would you like if you were dealt with

in the manner you propose to treat the neighbours?' Dealings among neighbours should be on the basis of equality and respect. Everyone in the world wants to be respected. Money and prestige is intended to serve the same purpose. So, respect your neighbour if you want to be respected. This is more important if your neighbour in any way has lesser worldly possessions; he is likely to be more touchy in this matter.

Do not believe a third party's reporting of the supposed critical views that your neighbour is said to have expressed about you. The third party may have its own axe to grind. Make your own judgments.

Some misunderstanding or irritation at some time is bound to arise among neighbours. This is quite common. Wherever two people live close to each other, a little bit of clash of personalities does arise in spite of best efforts. In such a situation, do not make children a party in the dispute. In fact, such disputes should never be discussed before children. Many a time, understanding among neighbours reappears when the children continue to be on good terms with each other.

If some misunderstanding or clash of interests appears among neighbours, do not talk about it to a third neighbour or a third party. That hardens the situation or the other person may provoke a dispute. It should be remembered that your neighbour is as anxious and as keen to keep good relations with you as you are. Try to see him from his point of view and make an advance to bridge the gulf of misunderstanding.

You may be able to do without your relations, but you cannot easily do without your neighbours.

21

SLOW DOWN PLEASE

"Gentlemen, excuse me. I have to attend another meet ing at 3.00 p.m. and it is already 2.55 p.m. I am afraid, I will have to rush."

This man, Mr. F., had to go now four miles away to another meeting. He had thought it would take him about ten minutes to reach there. On the way, however, there was a religious procession going and the whole traffic was stopped. Mr. F. was trying to wriggle through but in vain. He had an argument with a driver of another car as their cars scratched against each other. Fuming and fretting, he reached his destination at 3.30 p.m.

He left this meeting at 6 p.m. and started for home as he had invited some guests at dinner. On the way, he stopped at a wine-shop and asked the shopkeeper to hurriedly give him a bottle of whiskey. As there were some other customers already waiting, naturally, it took some time for the shopkeeper to attend to him. Mr. F. got furious and said, 'Look here, you are unnecessarily wasting my precious time.' The shopkeeper did not like this remark and said, 'If you care, you can go to another shop.' In a huff, Mr. F. left the shop and went to another, got his bottle and reached home.

At the dinner table that night, he was relating the day's incidence to his friends. His wife interrupted him and said, 'Rush and hurry are becoming part of your life. In the morning you get up, get ready, gulp down your breakfast and move out of the house. In the evening, when you come home, you are tired, exhausted and not in a mood even to talk. You take food, smoke and then take out your files and work on them again. Even while you are in the house, you are fully absorbed in your official matters which I can read on your face and your eyes. You have never cared to ask how I run the household or how the children are doing. It is for days and days together that you do not talk to children. By the way, do you even know in which class are they? You seem to think, it is none of your business; you earn money, and provide for us and that is more than enough.'

Hurry and rush are the order of the day especially in the metropolitan cities. You can witness it the most acutely on the roads. Even as the light at a crossing turns from red to yellow, within less than 1/100th of a second, the cars behind yours blow their horns to tell you, 'Get on, you slow and stupid.'

Even relaxation is hurried through. For some, the next Saturday evening or Sunday is fully packed with engagements early in the week. When they go on a vacation for a week or so, they pack it up with more than half a dozen places to go, so that they have to rush from one city to another, from one train to the next. On their return from the vacation they are more tired than relaxed.

Everybody is familiar with the feeling of being keyed up from nervous tension; this process is quite comparable to raising the key of a violin by tightening

the strings. The jitteriness impairs our work and functions. Our adrenals produce an excess of both the adrenaline and the corticosteroids, making us alert for "fight or flight".

Says Hans Selye, "*Man can be intoxicated with his own stress hormones.* I venture to say that this sort of drunkenness has caused much more harm to society than the other kind.

"We are on our guard against external intoxicants, but hormones are part of our bodies; it takes more wisdom to recognize and overcome the foe who fights from within. In all our actions throughout the day we must consciously look for signs of being keyed up too much—and we must learn to stop in time. To watch our critical stress-level is just as important as to watch our critical quota of cocktails. More so. Intoxication by stress is sometimes unavoidable and usually insidious. You can quit alcohol, and even if you do take some, at least you can count the glasses; but it is impossible to avoid stress as long as you live and your conscious thoughts cannot guage its alarm-signals accurately."

Forgotten Art of Relaxing

People in the cities have forgotten the art of relaxing. Sitting in a secluded place, lying down under a tree, sitting by the side of a lake or a river, watching birds or listening to their musical sounds, walking alone for long distances, have all become unfashionable. Everyone wants to pack up more in 24 hours.

Hurry, hurry, hurry. You cannot go on hurrying for long without spoiling your health. Mental tension, high blood pressure, heart disease, stomach ulcers are the consequences. Wear and tear of the body is more when you run it at high speed than at low; the

engine of the car and the human body suffer in the same way.

One can choose between working at a lower gear without trouble and for long, or at a higher gear with trouble and in constant danger of a breakdown in an essential organ, and collapse. 'Slow and steady wins the race', is not just another maxim; it is based upon the experience of many a wise man through the ages.

Working in a relaxed mood one can put in greater number of hours to work and even then feel neither fatigued nor exhausted. In between the busy schedule of work, one should occasionally interrupt work to relax.

Slowing down does not mean lessening the output. In fact, it provides more time for planning our work, and cuts down on needless activity. Whatever we do is qualitatively better and the results thereof are more advantageous.

Table 9

Methods of Diversion in Stress Management

A. *Solo-Active*
1. Reading
2. Writing
3. Photography.
4. Art, (e.g., painting, drawing, sculpting)
5. Playing a musical instrument
6. Collecting (e.g., stamps, coins, antiques, etc.)
7. Running
8. Hobbies (e.g., knitting, wood-carving, etc.)
9. Vacations

B. *Group-Active*
1. Sports (e.g., tennis, bowling, golf, etc.)
2. Games (bridge, poker, etc.)
3. "Eating out"
4. Vacations

C. *Solo-Passive/Group-Passive*
1. Television
2. Movies
3. Shows and Theatre
4. Listening to music (radio, records, tapes, etc.)
5. Concerts, opera
6. Sporting events (e.g., football, hockey, cricket, etc.)
7. Vacations

Morse and Furst, 1979.

22

PHYSICAL EXERCISE AND MENTAL TENSION

Ancient Greek philosopher-teachers delivered lectures to their students while strolling. The teachers spoke as they walked and the students listened to and put questions to them while walking in a group around them. It was felt that this was a better method of teaching as it involved the simultaneous working of the mind and the body.

Walking is going out of fashion nowadays. Many of us reach our place of work by some means of transport and then spend the rest of our working time sitting on a chair.

Women are the lesser defaulters in this respect. They do all their household chores and in the process provide physical exercise to most of their muscles. The result is that they have sounder bodies than men have. More men have pot-shaped tummies as compared to women; this could be seen strikingly when the whole community takes bath at the riverside on the day of a religious festival, but also otherwise.

Physical exercise is necessary in order to keep the body healthy, physically and mentally. It should be taken daily. Those who have not undertaken any physical exercise for a long time, may find the muscles

sore after they start it. This is an indication that those muscles which were not being used previously are now coming into use. If exercise is continued, gradually soreness passes away and a feeling of freshness and vitality comes in.

The start should be made with lighter exercises taken for a shorter period. Gradually more strenuous exercises for a longer duration could be resorted to.

Exercise is best done early in the morning in the open, in fresh air. It can also be done in the evening before dinner. Doing exercise with a full or half-full stomach is harmful.

Types of Physical Exercise

That depends upon the age of the person. For those between 20-40 years, strenuous games such as badminton, tennis, hockey, cricket, football or swimming are the best. For those in their forties and fifties, golf can be added to the above.

Running is the best form of physical exercise. It exercises all the muscles of the body including those of the abdomen. To begin with, one can run, say for a mile at an even pace if one feels exhausted in between, one can even walk for a short distance and then resume running. Gradually, one can run faster and increase the distance run up to two miles. Running a distance of two miles in 12 minutes is an ideal form of physical activity. Those in their twenties can certainly run longer distances. If it is not convenient to run on long straight roads, one can measure a distance in or around the house and can run that measured distance many times over, so as to make a total of two miles in 12 minutes.

Some people prefer, for various reasons, to run only on a spot, say, for example, in a room, or on

their small lawn. This is also good enough. Care must be taken to see that the feet are raised up from the ground for at least six inches. To begin with, one may be able to do this only for five minutes, but gradually one can do it for longer periods. Doing it for 12 minutes continuously is ideal.

Some people find brisk walking a very good form of exercise. It is particularly good for people in older age-groups and for those whom their doctors do not recommend strenuous exercises. It is also good for those who have had a heart attack before. Dr. Paul Dudley White, the world-renowned heart specialist, recommended and himself practised it enthusiastically. A four-mile brisk walk in the morning or evening keeps one fit physically as well as mentally.

Swimming and cycling are the other two physical exercises enjoyed by people of all age-groups and of both the sexes. One may not be able to do them daily; furthermore, for cycling a cycle and a clear road is needed, and for swimming a swimming pool. Yet for the sake of variety, one can do these exercises once a week or so.

Gardening is another form of physical exercise for those who have a garden and an aptitude for this type of work. While it keeps the body physically fit, it relaxes the mind very much. It is good from another point of view as well: the more tense one feels mentally, the harder he would dig and the more vegetables would grow or flowers come up!

While physical exercise is best done at a specified hour daily, some very busy people do not find it possible, though I wonder why. Obviously, physical exercise is quite low in their priority of doing things. Such people should make it a habit to do physical exercise

of their choice in the minutes they find between two assignments. And there are exercises for such people as well, as for example, running on a spot, lifting heels up, bending and touching the toes, etc. The important thing to remember is that one has to find minutes, even at odd moments, to stretch the muscles and to relax the mind.

Some people in India find Yogic *asanas* (postures) very helpful. These *asanas* have to be learnt first under the guidance of a teacher (*guru*). Doing *asanas* in groups produces more enthusiasm and there is greater likelihood of one's keeping up the habit.

More Work, Less Labour

Physical exercise, after one has been doing it for quite some time, makes the person do more work with less expenditure of energy. Athletes can run for longer distances without proportionately increasing their heart rates. On the other hand, those who have flabby muscles, get breathless and tired even after a little bit of physical exertion.

Some people, both men and women, develop swelling over the feet when they walk a little or even when they hang their legs and feet while sitting on a chair. Many of them lose this tendency after doing physical exercise because the contracting muscles squeeze blood out of the veins, improve circulation of blood and do away with the tendency of stagnation of blood.

For a person whose main job during the day is mental work, physical exercise is very important. This is to strike a balance between the two and to avoid mental tension. A person who does physical exercise regularly sleeps better at night, thereby providing more relaxation to the nerves and the mind.

Table 10

Benefits of Exercise

1. Provides stress relief.
2. Helps prevent coronary artery disease and possibly other diseases.
3. Delays the ageing process.
4. Improves breathing efficiency.
5. Strengthens muscles, tendons and bones.
6. Increases muscle flexibility. tone and reflexes.
7. Increases stamina.
8. Improves digestion.
9. Increases energy and reduces fatigue.
10. Enhances physical appearance including complexion and posture.
11. Increases appetite.
12. Results in better mental attitudes and frame of mind.
13. Results in improved thinking.
14. Promotes feelings of euphoria, tranquillity and relaxation.
15. Promotes muscular relaxation.
16. Provides a method to prevent and treat minor back problems.
17. Prevents varicosities.
18. Results in better support for internal organs.
19. Allows for easier and better sleeping.
20. Builts self-esteem and reinforces self-image.

Morse and Furst, 1979.

23

MUSCLES AND THE MIND

I am sure each one of you have been through a situation more or less like the one I mention below:

You are sitting in a group with your colleagues, may be in a lecture room or in a drawing room. One person is speaking and putting forward an argument. At once you feel that you can put forward the same argument in a better way, or that you can put a counter-argument. You decide that as soon as the speaker finishes speaking, you will get up and speak out your views.

Did you notice that as soon as you decided to speak, your heart beat faster, the pulse rate went up and you shifted in your seat frequently?

Now, in your mind, you start framing the sentences you have to speak. The heart starts thumping in your chest and the pulse rate rises further. Your palms become wet. Your jaw is clenched and if you put your palm at a place just below your ears, you can feel the muscles clenched and vibrating.

While you were framing your views in your mind, the speaker kept speaking, but hardly a word registered in your mind.

And then you got your opportunity to speak. When you got up, you were playing with some part of the furniture to give you support. Your voice, that your ears heard, was certainly peculiar; it did not seem your own. I can tell you that the listeners felt it a little slurring or disjointed. You blurted out a few sentences, which later you hardly remembered. Your last or concluding sentence was uttered more assuringly with a proper tone and modulation, and the last words which you spoke were "Thank you" and they were uttered in your usual manner.

You sat down in the chair. Then there was another speaker who asked a question, but your mind did not register even the head or tail of what he said.

Now let us analyse the above sequence. As soon as you decided that you had an argument to put forward, a tension rose in your mind and simultaneously in your body. This took the form of increased heart rate, breath rate, sweating palms and clenched muscles. Later, you said what you had intended to say, but the full force of your argument was marred by your distorted voice and non-cooperation of your tongue and brain while speaking. You spent a lot of physical energy and yet even if you had your argument right, it did not have that full impact on the audience.

If you are in a similar situation again, I would recommend you to take the following steps and then see the effect:

As soon as you decide that you would like to speak your views before the assembly, tell your body. 'Relax now'. Unclench your fists, droop forward your shoulders and, more particularly, take care that your lower jaw does not touch your upper jaw, i.e., your lower and upper set of teeth are not touching each other, just let

your lower jaw fall. Now take a few deep breaths. Relax all the muscles of your body that are tending to contract. In this state of your physical relaxation, take two or three deep but gentle breaths, and then frame your argument in your mind—just the argument, not each and every word of the sentences you have to speak.

After you have done that, continue relaxing your muscles and now give attention to what the speaker is saying, forgetting now about the views you have to put forth. Keeping your muscles relaxed particularly of your lower jaw and the forehead, take a deep breath, put a smile on your face and in a well-modulated voice say your views gently and slowly. Then sit down, keeping your muscles still relaxed.

You would yourself feel that you have been able to say what you intended to say and with the effect on the audience you had desired.

Relax the Muscles

One may not succeed wholly in the first attempt, but if one keeps in mind that one has to keep the muscles relaxed while intending to speak and while speaking, he will certainly come up to his own expectations.

One can learn to keep one's muscles relaxed in all day-to-day activities, for example, while speaking to one's wife or children, while writing, while concentrating on a problem, while driving a car. In the latter situation, one drives more effectively and tires less if one relaxes the muscles intentionally.

When in a state of mental tension, the best thing one can do to relieve it, is to purposely relax all the muscles of the body. By relaxation of the muscles I mean letting them go limp, as happens when you make

your fist and then open it and let the hand go limp.

Relaxed muscles relax the mind; inversely, tense muscles make the mind tense.

Learn to relax your muscles in all the various situations. That is the secret of being more effective in your efforts without tiring the body or mind. If you do it over a period of time, you would find that you remain calm in situations where others get tense. Your judgments are more sound, your body more healthy, and you are less prone to heart attack or ulcers in your stomach.

24

YOGIC METHOD OF RELAXATION

Yoga now no longer remains confined to remote *ashramas* in the Himalayas. Yogic techniques are depicted on television in India. People in various walks of life practise it to remain fit while housewives practise it to maintain their figures. Yoga lessens mental tension.

The system of Yoga as enunciated by Patanjali consists of eight components: *yama*, *niyama*, *asana*, *pranayama*, *pratyahara*, *dharna*, *dhyana* and *samadhi*. The first four components relate to the body; they prepare the body for the next four components which relate more to the mind.

Yama and *niyama* are associated with the rules of conduct. They are meant to break the usual habits of the mind and trends of the body, and to make them amenable to the dictates of the will. They require the person not to be violent, to love others, not to be covetous, to be helpful and such other things.

Yamas and *niyamas* provide one the capacity to think clearly and indulge only in such activities which lead to one's determined goal. They prevent frittering away of the limited energies and time available. They help one feel calm and relaxed.

The physical cleaning process mentioned in connection with *niyamas* are called *kriyas* or *shatkarmas*. These

are meant to remove the waste in the body, particular attention being given to cleansing of the alimentary tract, blood vessels and other passages. These cleansing processes are six in number: *Dhauti, Basti, Neti, Tratak, Nauli* and *Kapalbhati.*

Dhauti, Basti and *Neti* are meant to clean the stomach, the colon and the nose respectively.

Tratak

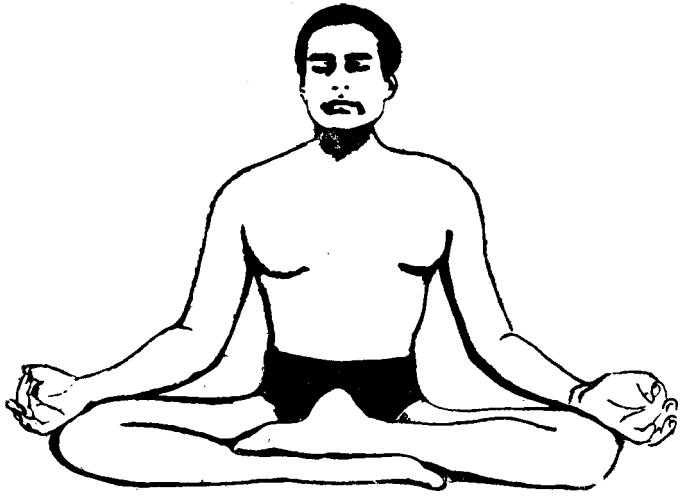
Tratak provides concentration of mind and relaxation. It consists in steadily gazing at a particular point or object without winking until tears come out. In one of the *tratak* methods, a candle flame is kept three to four feet away from the person. The flame and the eye should be in a horizontal line. Sitting erect, with the spine straight, and the body otherwise relaxed, the person looks at the flame with a steady gaze for one minute. After a minute, he closes the eyes and relaxes the eye muscles for an equal length of time. He repeats the process five or six times, gradually increasing the period of gazing and resting upto three minutes each.

In another *tratak* method called *bhrumadhya drishti*, the half-closed eyes are directed and turned towards the space between the eyebrows. This is done initially for a minute or so, but gradually increased to ten minutes.

In *nasagra drishti* (nasal gaze), another *tratak* method, one gazes at the tip of the nose.

Asanas

In order to concentrate one's mind for as long as one needs to do during Yoga practice, one must sit in a posture which is pleasant and firm. Keeping this in mind, Yoga *gurus* evolved and described different



Padmasana

postures (*asanas*). According to Patanjali, an *asana* should be *sthirasukham*—stable and agreeable.

Padmasana

Four *asanas*, namely *Padmasana*, *Siddhasana*, *Svastikasana* and *Sukhasana* are meant to be employed during meditation. Spine erect, sitting motionless in these postures, the mind becomes free from all physiologic disturbances. Moreover, the metabolic processes are reduced to a minimum, allowing the person to sit for longer periods of time.

Siddhasana

Shavasana

Another *asana*, called *Shavasana*, the Corpse posture, is particularly helpful in providing mental relaxation. In it, the person wearing loose clothes

Shavasana

lies flat upon the spine. He lets go all the muscles of the body, as if he were dead. Alongside, he concentrates his mind on one object only and does not allow it to wander.

Initially, one feels tempted to move a part of a muscle or limb. He also feels the mind wandering about from one thought process to another. But gradually, with practice, he can lie down for more than 10 minutes.

This posture indeed provides relaxation to the body and the mind, and after doing it one feels a pleasant relaxation.

Shavasana one can do morning and evening. It is more efficacious than most other procedures of getting relaxed.

Asanas relax the body and the mind. They are unlike usual physical exercises in which the muscles feel fatigued afterwards.

There are other yogic procedures too which relax the body and the mind. These can be learnt in one of the many yogic *ashramas* found all over India. They are the most natural procedures to relax the body and mind.

25

MEDITATION FOR LESSENING MENTAL TENSION

Meditation is regarded now-a-days as a useful means of relaxing the mind and the body. After withdrawing the sense organs from their natural outward functioning and shutting the mind resolutely against all impressions from outside, sitting in an easy posture, one can fix the mind inwardly on an object or an idea. Initially the mind wanders in all directions, but gradually one can take hold of it and close it to all outward sensations, such as hearing, seeing, touching, smelling or even thinking. When that is achieved, the external environments do not influence the person at all. One can then hold the object in mind without interruption for a fair length of time. This is meditation. Since the mind is not disturbed by outside influences or ideas, it is at rest "like a calm sea."

The concept of meditation is an old one. It is one of the features of the yogic practices. It has also been prevalent in China, among the Muslim Sufis and among some of the Christian sects.

Since the last three or four decades, many scientists in different parts of the wo rld, have tried to investigate the capabilities of meditation to lessen the mental and physical stress and to relax the mind and the body.

Experiments on Yogic Meditation

Meticulous experiments have been planned and executed by different scientists on yogis during meditation. Change in the various functions of the body have been recorded and compared with subjects not doing any meditation. Observations recorded include data on oxygen consumption, carbon dioxide output, basal metabolic rate of respiration, pulse rate, electrocardiographic (E.C.G) and electro-encephalographic (E.E.G) changes and changes in galvanic skin resistance (G.S.R).

An experimental study on the effects of yogic meditation on different functions of the body was reported in 1961 from the Physiology Department of the All-India Institute of Medical Sciences, New Delhi. The three neurophysiologists of the Institute, Drs. Anand, Chhina and Baldev Singh planned the experiment and made the observations. An air-tight metallic-cum-glass box 6' x 4' x 4', having a window for entry fitted with air-tight holes for the passage of electrical wires, was made for the yogi to stay in. The yogi stayed in this box on two occasions for 8 and 10 hours respectively. The temperature inside the box was kept adjusted at 27 C° $\pm$ 0.5 C°. These studies were carried out on him after he had taken a light meal on the previous night and had nothing to eat in the morning. He was provided with a mattress, two bottles, one for drinking water and the other for voiding urine. A press button for buzzer was also fixed inside.

Samples of air from the box were taken at the start of the experiment. They were withdrawn every half hour and analysed. The total values for oxygen and carbon dioxide in the box at any time were used to

determine the rate of oxygen consumption and carbon dioxide output during the previous half hour. Basal metabolic rate was calculated. Simultaneously, E.E.G., E.C.G. and respiratory movements of the yogi were recorded.

The normal individuals were also studied in identical manner to serve as controls; one stayed in the box for four hours and the other for seven hours.

This study showed that the yogi was able to voluntarily reduce his oxygen consumption considerably below his basic oxygen requirements. Carbon dioxide output was also reduced. While one control showed increase of oxygen consumption above the basal requirements, the others showed no change. The heart rate of the yogi was 85 per minute as he entered the box. The respiration rate during this period did not show any significant rise. In the normal control subjects, the respiration rate gradually increased and the heart rate also showed some increase with the drop of oxygen and rise of carbon dioxide. E.E.G. showed predominantly low voltage fast activity associated generally with initial stages of sleep. The typical delta rhythm associated with deep sleep was not obtained. This study showed that the yogi could reduce his oxygen intake and carbon dioxide output to levels significantly lower than his requirements even under basal conditions.

In 1972, Drs. Kothari, Bordia and Gupta, from Udaipur Medical College, reported a study on a yogi during his eight-day confinement in a sealed underground pit. Initial physical examination and some biochemical investigations were done. The yogi looking around 70 years old, sparsely built, was confined in an underground pit 1.5 metres cube and was connected with wires to an E.C.G. machine kept at a distance of

two metres from the pit. The E.C.G. was monitored continuously and recorded at least at 4-hourly intervals. The pit which contained the yogi was closed by first placing wooden planks across it and then covering them with loose earth piled to a height of half a metre above ground level and extended one-third of a metre beyond the edge of the pit on all sides. Finally a layer of bricks was placed on the top and plastered with cement and mortar.

The pit was finally opened on the eighth day early in the morning. As per instructions given by the yogi beforehand, he was lifted out into the adjoining laboratory, vigorously massaged with oil and given a hot bath. A thorough clinical examination was done and all other investigations were repeated.

Results of some of the investigations done on him immediately before entering the pit and just after coming out of it were as follows. Figures within the brackets indicate findings after he came out of the pit. Weight 55 kg. (50.5 kg)., blood pressure 164/92 (140/88); pulse rate 106 per minute (98 per minute); respiration rate 20 per minute (16 per minute); oral temperature 37.2C (34.8C); blood sugar 88 mg% (73. 3 mg%); blood urea 30 mg% (66 mg%); blood proteins 5.8 gms% (5.5 gm%) blood calcium 9.8 mg% (9.2mg%); blood cholesterol 220 mg% (300 mg%); E.S.R. Wintrobe 15 mm. (18mm.) haemoglobin 12.5 gm% (12.0 gm%); packed cell volume 24% (29%); total leucocyte count 4600/cmm (9200/cmm).

As regards E.C.G., soon after the pit was sealed, a rapid pulse was observed. This became more marked and the heart rate increased to 250 per minute. This persisted till the second evening when at 5.15 pm (after 29 hours of internment), a straight line at once replaced

the E.C.G. tracing. On the morning the yogi was to be externed, the E.C.G. acitivity returned half an hour before the pit was scheduled to be opened: pulse rate of 142 per minute was recorded, with no other abnormality. Nearly two hours after the yogi had been taken out of the pit, the E.C.G. showed a normal tracing with heart rate of 98 per minute.

When the pit was opened on the morning of the eighth day, the yogi was in stuporous condition and felt very cold. On being taken out, he developed severe shivering and this persisted for nearly two hours.

Physical and biochemical investigations, before and after the internment of the yogi, revealed that his metabolic activity had not been cut down appreciably. These investigations followed the same pattern as are expected in total starvation.

Heart Beat: Yogis in India have long been reputed to voluntarily stopping the heart beat. One of the first investigators to look into these claims in an objective manner was a French cardiologist, Therese Brosse, who came to India in 1935, equipped with a portable electrocardiograph so that she could monitor the activity of the heart. Brosse concluded from her observations that one of her subjects actually was able to stop his heart. In 1957, two physiologists working in America, Dr. Bagchi of the University of Michigan Medical School, and Dr. Wegner of the University of California, Los Angeles, conducted a more extensive investigation in collaboration with Dr. Anand of the All India Institute of Medical Sciences in New Delhi. None of the yogis they studied with more elaborate equipment than Dr. Brosse had used, showed a capability for stopping the heart. Wegner, Bagchi and Anand did find, however, that some of the yogis could slow both heart beat and respiration

rate. In 1961, Dr. Anand and Dr. China reported their findings on three yogis who claimed to voluntarily stop beating of their hearts. During the act, their pulse was examined and heart was auscultated. E.C.G. respiration rate, and heart sounds were also recorded. Screening and X-ray were also taken. It was observed during the manouver of stopping the heart that all the yogis took a few deep breaths and then held the breath either in deep inspiration or expiration. This lasted 10 to 20 seconds. On auscultation during these acts, the heart sounds could not be heard and the radial pulse could not be felt. These findings were confirmed by playing back the tape-recording of heart sounds. Blood pressure could not be recorded as there was no pulse. On the other hand, E.C.G. recordings showed that none of the individuals could attain stoppage of the heart as E.C.G. tracing recorded regularly and showed no significant abnormality. X-ray and screening revealed that while the heart beat continuously, it had become narrow in transverse diameter. The yogis reported a feeling of giddiness and fainting after prolonged attempts to influence the circulation in this manner. These experiments showed that none of the yogis had any actual control over the activities of the heart. They could influence the intensity of their heart beats by raising the intra-thoracic pressure. By taking deep inspirations or expirations and by closure of glottis and contraction of the chest and abdominal muscles, the thin-walled veins in the thorax were obstructed, thereby greatly reducing the venous return to the heart. This led subsequently to decrease in cardiac output, so much so that the arterial pulse and heart beat became imperceptible.

Thus we find that while yogis can voluntarily diminish the rate of heart beat, they cannot stop it from

beating and the E.C.G. impulse formation cannot be interfered with.

Respiration: Dr. Bagchi and Dr. Wegner in 1957 found that during meditation, the rate of respirations tended to decline relative to the levels set during control period. In 1961, Wegner and Bagchi again reported the rate of respiration to be slower during meditation than during reclining relaxation. In 1961, Dr. Anand and his colleagues found dramatic decrease in oxygen consumption during meditation in an air-tight box.

Energy Expenditure: In order to investigate whether a person spends less energy while he is meditating than while he is just sitting, a practitioner of yoga 32 years old, who on several occasions had gone into a deep meditative state, was studied. The subject reported in the laboratory in the morning, and rested in the lying down position and again after he had been in a sitting position for some time. Then he was asked to start meditation. Metabolic rate was noted at frequent intervals of about 15 minutes, and just prior to discontinuing meditation. He was thus tested on three days successively in the morning. The period of meditation was approximately 45 minutes. It was found that the mean sitting metabolic rate of 37.1 cal/m/hr. was reduced to the mean metabolic rate of 29.67 cal/m/hr during meditation, a difference of —7.43 cal/m/hr. This shows that sitting in meditation lessened the basal metabolic rate and amount of heat liberated in the body.

Brain Waves: Electrical recordings from the surface of the brain or from the outer surface of the head demonstrate electrical activity in the brain. Both the intensity and patterns of this activity are determined to a great extent by the overall excitation of the brain. The undulations in the recorded electrical potentials are called the brain

waves and the entire record is called the electroencephalogram (E.E.G.). The intensities of the brain waves on the surface of the scalp range from zero to 300 microvolts and their frequencies range from once every few seconds to 50 or more per second. The character of the waves is highly dependent on the degree of activity of the cerebral cortex, and the waves change markedly in different emotional and mental states of the person. Much of the time, the brain waves are irregular and no general pattern can be discerned in the E.E.G. However, at other times, distinct patterns appear. In normal persons, such patterns are classified into alpha, beta, theta and delta waves.

The normal adult, physically relaxed with eyes closed, produces a rhythmical brain wave with a frequency of 8 to 13 cycles per second. This brain wave disappears when the eyes are open, but can occur even then if the person is in a state of extreme relaxation. Since these waves were the first to be discovered they are labelled as alpha waves. Beta waves occur at frequencies of more than 14 cycles per second and sometimes as high as 50 cycles per second. Theta waves have frequencies between 4 to 7 per second. Delta waves include all the waves of the E.E.G. below $3\frac{1}{2}$ cycles per second and sometimes as low as 1 cycle per every 2 to 3 seconds. Alpha waves usually appear in a relaxed mental state of a person, beta waves during intense mental activity, theta waves more commonly in infants, and delta waves during stupor, sleep or surgical anaesthesia. The importance of recording E.E.G. during meditation lies in the fact that the particular brain waves indicate a particular mental state of the person.

Kasamatsu, a Japanese neuropsychiatrist and his co-researchers in 1957, compared the E.E.G.'s taken

during meditation of an experienced yogi and a control subject whose resting E.E.G. was similar to that of a yogi. After eight minutes, the yogi demonstrated a substantial increase in alpha activity; while the pattern of the resting control remained unchanged. There was no blocking of the meditator's alpha rhythm on the sudden presentation of auditory stimuli. Dr. Anand and his colleagues in 1961, described electroencephalographic studies on yogis. Four yogis practising samadhi had their E.E.G. recordings taken before as well as during meditation. Two of them were exposed to external stimuli in the form of strong light, loud banging noise, touching with a hot glass tube and exposure to the vibrations of a tuning fork. The effect of these on the E.E.G. activity was studied both before as well as during meditation. All the yogis showed prominent alpha activity in their normal resting records. During the stage of samadhi all of them had persistent alpha activity with marked increase in amplitude. In both the yogis who were exposed to external stimulation, all the stimuli blocked the alpha rhythm and changed it to a low voltage fast activity when the yogis were not meditating. This blocking reaction did not show any adaptation to repetition of the same stimuli. On the other hand, none of these stimuli produced any blockage of alpha rhythm when the yogis were in meditation.

As part of the same study, two yogis who had developed increased pain threshold to cold water were also investigated. They were able to keep their hand in water at 4 C° for 45 and 55 minutes respectively without experiencing any discomfort. Their E.E.G. records were obtained before and during the period when they kept their hand in cold water. Their E.E.G. records showed persistent alpha activity both before and during the

period in which the hand was immersed in cold water.

Thus it can be said that yogic meditation gives rise to the appearance of alpha brain waves, which, when the yogi is meditating, are not blocked by external stimuli.

Skin Resistance and Relaxation: Galvanic skin resistance (G.S.R.) is an incompletely understood but fairly accurate measure of the state of a person under stress or in relaxation. G.S.R. is measured by placing electrodes on the skin surface and measuring the resistance to a mild electric current. The G.S.R. has long been known to decrease with anxiety or stress and increase during relaxation and has formed the basis of the 'lie detector'. During deep sleep, relaxation of the body promotes an average but slow increase in skin resistance of about 350 per cent. The measurement of G.S.R. during meditation forms a good index of the mental state of the person.

In 1957, Drs. Bagchi and Wegner found galvanic skin resistance to be increased during meditation with a mean increase of 56 per cent compared with the control periods. When they compared the responses of four yoga students during meditation in Padmasana with their normal responses, galvanic skin resistance was found to be greater during meditation.

To sum up, the data obtained from experimental studies on yogic meditation show a decrease in oxygen consumption, a decrease in carbon dioxide elimination, a decrease in basal metabolic rate, diminished heart rate and respiration, production of alpha rhythm in E.E.G. and increased galvanic skin resistance. All these observations suggest that yogic meditation leads to a hypo-metabolic mental relaxation produced in the person as a result of meditation.

Zen Meditation

The word Zen, in fact, means meditation. It is a Japanese word, corresponding to the Chinese *chan* and the Hindi *dhyana*. It is the essential theme of a sect of Buddhism which flourished in China during the Sung period (between A.D. 1000 and 1300), and entered Japan in the twelfth century.

Zen meditation is difficult to describe in words. It means more like the words "intuition" and "realization". It means a way of life in which there is no division between thought and action; no gulf between the unconscious and the conscious mind; and no absolute distinction between the self and the external world, even between the various parts of the external world and the whole. For a student, Zen practice begins with his continuing the inhalations and exhalations of his breath while he is in the motionless Zen posture. Mind is concentrated on breathing-in and breathing-out, forgetting all other things, surroundings and environments. In continuing the in-and out-breaths in natural rhythm and without strain, the mind, as it were, has a scaffolding to support it. When concentration on the breathing becomes such that awareness of the counting is clear and the count is not lost, the next step, a slightly more difficult type of Zen, is following the inhalations and exhalations of the breath with the mind's eye only, again in natural rhythm. A blissful state of mind is said to flow from concentration on the breath in this manner. Next follows Zen with a *koan*, a riddle, to meditate on. The aim is not for the student to find a solution of the riddle through rational processes, but to provide a more difficult exercise in concentration. Through intense self-inquiry, the mind gradually be-

comes denuded of its delusive ideas which in the beginning hamper its effort to become one with the *koan*. As these abstract notions fall away, concentration on the *koan* strengthens. Once the *koan* grips the heart and mind, the inquiry goes on ceaselessly in the subconsciousness. So long as the mind is occupied with a particular task, the question fades from consciousness surfacing naturally as soon as the action is over. The highest form of Zen meditation is *shikan taza*, "just sitting". A person meditating is not supposed to do anything except to be sitting. During meditation, thinking and fantasy are treated as intruders or distracting influences, to be patient with until they go away. Sitting Zen and mobile Zen are two aspects equally dynamic and mutually reinforcing. One who sits devotedly in Zen everyday, his mind free of discriminating thoughts, finds it easier to relate himself wholeheartedly to his daily tasks, one who performs every act with total attention and clear awareness, finds it less difficult to achieve emptiness of mind during sitting periods.

To learn doing Zen meditation is not easy. One has to be thoroughly embued in its philosophy before one can approach it. The uniqueness of Zen lies in the fact that the mind is freed from bondage to all thought forms, visions, objects and images. In the broad sense, Zen means to enter fully into every action with total attention and clear awareness.

Heart Beat: In 1972, Goyeche and his colleagues compared the effect of Zen meditation with relaxation in eight subjects. They found that the heart rate decreased appreciably during Zen meditation.

Respiration: Japanese physiologists Sugi and Akutsu in 1968, observed a 20 per cent decrease in oxygen consumption and reduction in output of carbon dioxide

during meditation in ten Zen monks. In 1960, Japanese neuro-psychiatrist Hirai noticed that the respiratory rate decreased during Zen. In 1968, Akishige showed both a decrease in oxygen consumption and rate of respiration during Zen meditation. In another study by Goyeche, Chihara and Shimizu in 1972, rate of respiration associated with Zen meditation was found to be slower than during control periods.

In 1957, Japanese neuro-psychiatrist Kasamatsu reported substantial increase in alpha activity during Zen meditation by an experienced practitioner of Zen. Blocking of alpha activity by external stimuli was not observed. In another study by Kasamatsu and Hirai in 1966, 48 priests and disciples of Zen Buddhism were selected as subjects and their E.E.G.'s were continuously recorded before, during and after meditation. The appearance of alpha waves was observed, without regard to open eyes, within 50 seconds after the beginning of meditation. The alpha waves continued to appear and their amplitudes increased. As meditation progressed, a decrease from alpha frequeney gradually manifested, and a theta pattern with alpha background was observed in some of the priests. These E.E.G. changes could be classified into four stages: the appearance of alpha waves (Stage I), an increase of alpha amplitude (Stage II), a decrease of alpha frequency (Stage III), and appearance of rhythmical theta pattern (Stage IV). These four stages of the E.E.G. changes ran parallel with the disciples' mental stages and years spent in Zen training. In 1969, Kasamatsu and Hirai observed that both alpha and theta activity were blocked by the presentation of auditory (sound) stimuli.

Skin Resistance and Relaxation: In 1968, in his study of experienced practitioners of Zen, Akishige reported an increase in galvanic skin resistance.

To sum up, the data obtained from experimental studies on Zen meditation show almost the same pattern of response as observed during yogic meditation. Exposure to sound stimuli, however, blocked alpha pattern of brain waves produced through Zen meditation; in yogic meditation this blocking of alpha waves did not occur, showing thereby that through yogic meditation, one becomes more oblivious to external environments than is possible through Zen meditation.

Transcendental Meditation

Transcendental meditation is a technique for expanding conscious awareness and for reducing stress and tension. The word "transcendental" means "going beyond". The technique claims to take the practitioner beyond the familiar level of wakeful experience to a state of profound rest coupled with heightened awareness.

Heart Beat: Robert Keith Wallace, initially at the University of California, Los Angeles, and later at Harvard Medical School, and Herbert Benson, cardiologist and associate professor of medicine at Harvard Medical School, have made the maximum number of scientific observations in transcendental meditation. In Wallace's study of 1970, heart rate of each of the subjects decreased during meditation, with a mean decrease of five beats per minute. In 1972, Wallace and Benson, again reported a decrease in heart rate during transcendental meditation.

Respiration: In 1970, Wallace found that during transcendental meditation, oxygen consumption decreased in all subjects within 5 minutes after beginning meditation. The mean decrease was about 45 cubic cms. per minute or about 20 per cent decrease from the control period. A mean decrease in total ventilation during meditation of about one litre per minute was observed. The observed decrease in total ventilation was caused by either decrease in frequency of breath or tidal volume, varying from subject to subject.

Wallace, Benson and Wilson in 1971, and Wallace and Benson in 1972, confirmed in precise detail what had been reported earlier about oxygen consumption and showed that carbon dioxide elimination decreased from 219 cubic cms per minute to 187 cubic cms., during meditation, and then returning to about the pre-meditation level afterward. The relation of carbon dioxide elimination to oxygen consumption remained essentially unchanged throughout the three periods, which indicated that the controlling factor for both was the rate of metabolism. The reduction in metabolic rate (and hence in the need for oxygen) during meditation was reflected in decrease, essentially involuntary, in the rate of respiration (two breaths less per minute) and in the volume of air breathed (one litre less per minute).

The most interesting finding they reported was about blood lactate concentration. Measurements of lactate concentration in the blood (an indication of metabolism in the absence of oxygen) showed that during meditation, the subject's lactate level declined precipitiously. During the first 10 minutes of meditation, the lactate level in the subject's arterial blood decreased at the rate of 10.26 mgs per 100 cubic cms. per hour, nearly four times faster than the rate of decrease in

people normally resting in a supine position or in the subjects themselves during their pre-meditation period. After the subjects ceased meditating, the lactate level continued to fall for a few minutes and then began to rise, but at the end of the post-meditation period, it was still considerably below the pre-meditation level. The mean level during the pre-meditation period was 11.4 mg per 100 cubic cms., during meditation 8 mg. and during post-meditation 7.3. mg.

Lactate level in the blood is said to be one of the indices of the state of mind of a person. It is diminished during sleep and in a relaxed state of mind; it is increased when the person is tense and agitated.

Brain-waves: In 1970, Wallace reported E.E.G. findings in fifteen normal college students whose practice of transcendental meditation had ranged from six months to 3 years. Each subject sat quietly with eyes open for 5 minutes and then with eyes closed for 15 minutes. He meditated for 30 minutes, continued to sit with eyes closed for 10 minutes, and then sat with eyes open for 5 minutes. Before meditation, with eyes closed all subjects showed alpha activity. During meditation, the regularity and amplitude of the alpha waves increased in all subjects. In four of the subjects, the alpha waves changed to a slower alpha wave frequency and in some cases stopped for 2 to 5 minute periods and low voltage theta waves predominated. In almost all subjects, alpha wave blockade appeared after sound or light stimuli. After meditation, regular alpha activity continued when eyes were closed, and irregular alpha activity developed when eyes were open. In 1971, Wallace Benson and Wilson substantiated these findings.

Neurologist Banquet conducted very comprehensive investigations on the E.E.G. patterns in subjects during transcendental meditation and in control subjects who relaxed for 30 minutes with eyes closed. He noted that alpha waves which were present in the resting state of all meditators increased in amplitude during the first stage of meditation. Then occurred a shift to slower frequencies, mainly theta wave patterns, but unlike the theta and delta patterns of drowsiness. Four advanced meditators went into a third stage which they identified as either deep meditation or pure awareness. During this stage, synchronous beta waves of an almost constant frequency and amplitude appeared over the entire scalp. In all meditating subjects, the end of meditation repeated the stage one pattern, with an increase in alpha waves. In the advanced meditators, alpha and sometimes theta waves persisted after meditation, even with eyes open.

A significant finding that emerged from Banquet's researches was that the brain wave patterns tend to synchronize during deep meditation. To this phenomena of marked uniformity of frequency and amplitude in electrical activity from all areas of the brain, Banquet gave the name of 'hypersynchrony'. According to him, this may have something to do with the feeling of pure awareness or consciousness.

Skin Resistance and Relaxation: In 1970, Wallace reported a substantial increase in palmer G.S.R during meditation. This increase was, however, not sustained in the rest period following meditation. In 1971, Wallace and his colleagues observed a substantial increase of approximately 60 per cent G.S.R. during meditation. In 1973, Schwartz reported a very slight increase in G.S.R. during meditation.

To sum up, the data obtained from experimental studies on transcendental meditation show a response akin to that found in yogic meditation and Zen meditation: pulse and respiration rate is decreased, oxygen utilization and carbon dioxide output is decreased, there is slowing and in some studies, increased synchronization of electrocortical rhythms and an increase in G.S.R.

Meditation versus Simple Relaxation

An inspection of all the different meditative techniques shows some interesting similarities. Virtually all forms of meditation require physical immobility. All require some form of perceptual concentration. The concentration may be on an object, idea, image or *mantra*, breathing or *koan*. A question naturally arises: could responses similar to those produced by Yoga, Zen or Transcendental Meditation be produced by other forms of relaxation techniques? In order to test this point, Beary and Benson drew up a new technique, based upon the already known techniques of meditation but simplified and shorn of their esoteric contents. The new technique had the following essential components: (1) a mental device which provided a constant stimulus such as a sound; a word, or a phrase repeated silently or audibly, or fixed gazing at an object, the purpose being to minimize one's attention to other stimuli; (2) a passive attitude so that if distracting thoughts occur during the repetition or gazing, they could be disregarded and one's attention redirected to the technique; (3) a decreased muscle tonus so that the subject could be in comfortable posture and minimal muscular work is required, and (4) a quiet environment productive of minimal environmental stimuli. Such a technique was

tested on 77 healthy subjects, 10 females and 7 males. The subjects taught themselves this relaxation technique from an instruction sheet provided to them. Each subject was observed for five consecutive periods of twelve minutes each. Three of the periods were control periods in which the subjects sat quietly and read material selected for its neutral emotional content; for one period the subjects were instructed only to close their eyes, and for another period, instructions for the relaxation technique were followed.

Results: During the practice of this relaxation, oxygen consumption decreased by 13 per cent, carbon dioxide production decreased by 12 per cent, and respiratory rate decreased by 4.6 breaths per minute below control values (obtained while sitting quietly, reading). Respiratory quotient remained unchanged throughout the experiment. The procedure of simply sitting quietly and closing the eyes failed to produce a statistically significant drop in oxygen consumption, carbon dioxide production and respiratory rate below the mean control values.

The results of this study were closely parallel to the 1970 and 1971 findings of Wallace and others, in which these parameters were measured during the practice of transcendental meditation. These findings show that meditation as such without any esoteric ritual, as is inserted in other systematized forms, can be as effective in providing relaxation. This is a significant finding. If and when confirmed by other researchers, it can be made use of by more and more people without actually learning it from teachers or undergoing long-drawn preliminaries and precedures.

Use of Biofeedback Techniques

Biofeedback is a technique that uses various procedures and instruments to teach people how to voluntarily control "involuntary" activities, such as blood pressure, heart rate, brain wave production, certain muscle activity, body temperature, vasodilatation (opening up of blood vessels), vasoconstriction (closing down of blood vessels) and skin resistance levels and fluctuations (control of sweat gland activity).

In response to meditation or relaxation, there are decreases in breathing rate, pulse rate, blood pressure, muscle activity and fluctuation in skin resistance (less sweating), but one cannot voluntarily select to have one response. However, with the use of biofeedback, it is possible selectively to alter each one of these physiological responses.

We have seen that reaction to stress is a function of individual make up. Individuals may have selected areas of their body affected by stress, and therefore, come down with specific symptoms and diseases. Theoretically, then, one could selectively control different parts of his autonomic nervous system with biofeedback, so that, for instance, one could reduce blood pressure, control stomach acidity or induce muscle relaxation in the scalp muscles to help control hypertension, ulcers and tension headaches, respectively.

There are three major features of biofeedback control. First, the physiological activity must be one that can be monitored and amplified by electronic instrumentation so that the subject can be made aware of it. The usual methods are visual (seeing a moving signal) or auditory (hearing a specific sound). Second, physiological changes must send off appropriate messages to the individual to let him know that something

is occurring in his internal environment, e.g., the "sinking feeling in the gut" with stomach-chemical activity. The third feature is that knowing a change is occurring and becoming aware of its direction by the appropriate signal, the person then tries to change the activity in the desired direction (e.g., alter the "sinking feeling" to one of calmness).

In order to change the activity, the individual employs his own particular method. For instance, he could use meditation, relaxation, or work by trial and error. The person is made aware of the alteration in physiological activity by a change in the signal. For example, one way is to attach electrodes from the biofeedback monitor to the finger tips in order to detect skin resistance levels and changes. A second connection is made to an FM radio. When the electrodes are first connected, there is only a slight hum coming from the radio. When the person is asked to increase skin resistance level (a decrease in sympathetic nervous system activity would do this), he might do so by using meditation. Without being fully aware of what was happening physiologically (i.e., no "vibes" come from the skin to tell him when he was or was not beginning to sweat), he would know that he was successful when he heard music coming from the radio. The louder the music sounded, the greater the increase in skin resistance would be. Should the music stop, then the individual would have a way of knowing, i.e., the feedback or information aspect—that he was not changing the skin resistance in the desired direction.

In psychology and medicine, there are several types of biofeedback instruments, which are adapted for use with the following: heart rate and blood pressure; skin resistance (galvanic skin resistance or G.S.R); brain

wave patterns (specifically trying to attain high levels of alpha or theta waves for deep relaxation); blood flow (to try to reduce tension or migraine headaches); and muscle activity (to attempt to decrease microvoltage output from muscles, known as electro-myographic activity or E.M.G).

Let me illustrate the procedure by an example. In order to measure E.M.G. of the frontal muscle, of the scalp for the purpose of biofeedback, the electrodes are put in a band that is placed over the patient's forehead. As the muscles relax, the E.M.G. activity lessens, whereas the reverse occurs with muscle contraction. Associated with these changes in muscle activity are changes that may be seen on the machine dial, and the patient hears or fails to hear an auditory deeper tone. When the patient hears the tone, he knows his muscles are contracting and he initiates a technique to relax the muscles (e.g., meditation). If the patient hears a reduction in the tone, he knows he is relaxing the muscles, and he continues to use his particular relaxation method.

Since biofeedback is expensive and its use takes time and training, one may wonder why we use this method when meditation requires no machinery. One reason is that some people cannot get as deeply relaxed with meditation as they can with the use of biofeedback. It may be that when subjects become aware of their level of relaxation by a direct signal, they can achieve a deeper state of relaxation than when they relax without knowing specifically how "deep" they really are.

Another possible reason to employ biofeedback is that certain people cannot or will not use meditation. For them, the "scientific" appearance of the biofeed-

back technique might be appealing so that they would attempt to use this method.

Once people become proficient in the use of biofeedback, they can respond directly to the associated body cues they receive when they are achieving deep relaxation. They can then transfer to a relaxation method without the aid of the machine.

Since biofeedback is also effective in selective control of different aspects of the autonomic nervous system (e.g., lower heart rate at the same time that skin temperature is increased), this is helpful in the control of various diseases such as high blood pressure, tension, headaches, etc.

26

HOW TO CALM NERVES

All of us experience tension and anxiety of a short duration in our day-to-day living. It may be unpleasant yet it leaves no ill-effect behind. However, when it becomes a regular feature in a person so that he cannot get rid of it, it starts telling upon his physical and mental health.

According to Dr. George Stevenson, you can recognise mental tension if you notice the following signs in a person:

1. Minor problems and small disappointments throw one into confusion.
2. One finds it difficult to get on with people, or people as a rule have trouble in getting on with that particular person.
3. Small pleasures of life fail to satisfy.
4. One is unable to stop thinking of one's anxieties.
5. One fears people or situations that never bothered one before.
6. One becomes suspicious of people, distrustful of friends.
7. One feels inadequate and suffers the tortures of self-doubt.

If you are in such a situation, you must get out of it as it is bound to have a harmful effect upon your

physical and mental health. A few suggestions may prove helpful.

Some Suggestions

Try to recognise what is it that is causing you tension and worry; whether it is maladjustments in the family, financial worries, a responsibility that you find yourself unable to bear, simple overwork, or whatever it is.

Discuss your problem with those in whom you have confidence, maybe your wife, a friend and well-wisher, a doctor or a lawyer or some other person. Mere confiding of your problem in someone else would relieve you of a lot of burden. Besides, while thinking aloud, it is probable that an idea strikes you or to the person with whom you are discussing, which may prove helpful in getting you out of the situation.

Some people find it very helpful to sleep over a problem. When they get up, they either have an answer to it, or they can think over it with a fresh mind.

If you have a problem which has been pestering you for some days or weeks, it is better to get away from the situation of the problem. Take a trip to some other city, maybe a hill station, or even to a holy or secluded place. This may help you to see the problem in a proper perspective; maybe, what you were feeling as important or essential does not seem to you so then; or thinking dispassionately, you may arrive at a solution or an understanding or even acceptance.

Maybe, you are becoming tense because you have so many problems at hand. Write down all your problems on a piece of paper. Then arrange them in the order of their severity or intensity. Having done that think about the problem that is on the top of the list,

and for the time being try to forget about the rest. After you have more or less conquered it or finished with it, then take up the next, then the next, but one, and so on.

Too many problems at a time cause confusion in the mind and thus create tension, and even apprehension. Their effect is analogous to facing half a dozen enemies together. But if you have one enemy at a time before you, you feel more confident of conquering it.

If you have lost your health or your job, or have recently met with a failure, or there has been some bereavement in the family which is pressing you down heavily, then remember that you are not the only one who has ever faced this situation. Each day and since ages, people have gone through such situations. While at the moment it never seems so, yet time is the greater healer. The wound may remain, yet it would hurt less as time passes. Look from yourself to the grief of others in similar situations and try to share their grief. It would lessen the intensity of your own feeling of pain.

Have patience. Some problems get more entangled if one cannot practise patience. Do not get discouraged and certainly do not get frustrated. Frustration generates anger which clouds one's judgment and there develops a tendency to over-react, to panic and to lose self-control and temper. One always feels sorry after having lost temper. It not only makes one look foolish afterwards but also lessens the chances of solving the problem. Learn to hold your temper. Whosoever loses temper, loses the case. One can be very polite but firm at the same time.

Try to accept a situation which you cannot change. It does not mean that you become apathetic. It is only

that you realise your limitations. A couple I know of, noticed their child losing his eyesight. He could see objects at a lesser and lesser distance. Consultation with an eye-specialist revealed that he had a congenital defect and there was a real danger that he would lose his eyesight in a few years' time. They naturally got very perturbed and worried. They showed the child to some other doctors who also could give them no assurance. Having realised the situation in which their child was, they started preparing themselves and him for the unavoidable that had to happen. Instead of wasting time here and there, they got the child admitted in one of the best schools for handicapped children where he not only started adjusting himself but also learnt a craft. When the child grew up, he kept himself busy in his craft and thus could support himself on his earnings.

This family accepted the situation and did the best it could under the circumstances. Hence, the good result.

Table 11

Anxiety Level Rating

Mental Signs
I frequently worry.
Many times I feel nervous.
Bothersome throughts run through my mind.
I often imagine frightening scenes.
I can't concentrate well.
I often belittle myself.
It takes me a long time to make a decision.
I find it difficult to stick to a job.
I don't feel happy

Physical Signs

My heart frequently races.
I get chest pains (my doctor says my heart is fine).
I have a tense stomach.
I vomit for no apparent reason.
I often get diarrhoea.
I often lose my breath.
Sometimes I feel as if I'm being smothered.
I have a habit of sighing.
I get dizzy for no apparent reason.
When upset, I sometimes feel like fainting.
I frequently have headaches.
I perspire a lot.
I get frequent chills.
I frequently blush.
I cry a lot over minor things.
My body often becomes immobilized (I find difficult to react).
I fidget around a lot.
Frequently, my whole body feels jittery.
I often pace around.
I often have no energy.
I tire easily.
I have trouble sleeping.
I don't have a good appetite.
I frequently stammer or have difficulty with my speech.

Morse and Furst (1979)

Table 12

Anxiety-trait Personality.

The following table pertains to the person's own evaluation about his anxiety-trait. The query is "You are in a situatian where you are being evaluated by other people". Circle one of the five alternatives for each of the following 15 items.

Experience					
Seek experience like this.	1 Very much	2	3	4	5 Not at all
Feel upset.	1 Not at all	2	3	4	5 Very upset
Perspire.	1 Not at all	2	3	4	5 Very much
Feel relaxed.	1 Very relaxed	2	3	4	5 Not at all
Have an "uneasy feeling."	1 Not at all	2	3	4	5 Very much
Look forward to these situations.	1 Very much	2	3	4	5 Not at all
Get fluttering in stomach.	1 Not at all	2	3	4	5 Very much
Feel comfortable.	1 Very comfortable	2	3	4	5 Not at all
Feel tense.	1 Not at all	2	3	4	5 Very tense
Enjoy these situations.	1 Very much	2	3	4	5 Not at all
Heart beats faster.	1 Not at all	2	3	4	5 Much faster
Feel secure.	1 Very secure	2	3	4	5 Not at all
Feel anxious.	1 Not at all	2	3	4	5 Very anxious
Feel self confident.	1 Very much	2	3	4	5 Not at all
Feel nervous.	1 Not at all	2	3	4	5 Very nervous

Normans S. Endler (1980)

Table 13

Self-Rating Anxiety Scale
(Assessment based on the situation of the patient within the last one week)

State	*None or a little of the time* 1	*Some of the time* 2	*Good part of the time* 3	*Most or all of the time* 4
1. I feel more nervous and anxious than usual.				
2. I feel afraid for no reason at all.				
3. I get upset easily and feel panicky.				
4. I feel like I'm falling apart and going to pieces.				
5. I feel that everything is all right and nothing bad will happen.				
6. My arms and legs shake and tremble.				
7. I am bothered by headaches, neck and back pains.				
8. I feel weak and get tired easily.				
9. I feel calm and can sit still easily.				

State	*1*	*2*	*3*	*4*
10. I can feel my heart beating fast.				
11. I am bothered by dizzy spells.				
12. I have fainting spells or feel like it.				
13. I can breathe in and out easily.				
14. I get feelings of numbness and tingling in my fingers and toes.				
15. I am bothered by stomach aches or indigestion.				
16. I have to empty my bladder often.				
17. My hands are usually dry and warm.				
18. My face gets hot and blushes.				
19. I feel asleep easily and get a good night's rest.				
20. I have nightmares.				

Interpretation

Below 45 —within normal range (no anxiety present)
45-59 —presence of minimal to moderate anxiety
60-74 —presence of marked to severe anxiety
75 and over—presence of most extreme anxiety.

William W.K. Zung and Jesse O. Cavenar, Jr. (1980)

27

ARE TRANQUILLIZERS NECESSARY

Increasing incidence of mental tension has led to the discovery of tranquilizing drugs. When these drugs were administered in the laboratory to agitated monkeys and other animals, they quietened and calmed down, became gentle and even playful. Insane patients in lunatic asylums became quiet and less disorderly, and it was discovered that these drugs had an overall soothing effect. Even cautious physicians reported the results as 'sensational and miraculous'. This led to their use in the case of people who were under stress, tension and worry, but were not admitted to hospitals. In some Western countries, tranquillizers are now sold in large numbers and are used by frantic, temperamental, over-worked and over-charged businessmen, officials, professors and even housewives. They are now increasingly used in India by the same group of people. The enthusiasts claim several qualities for them: they are harmless, non-sedative, non-habitforming and keep the mind clear.

Over the years, however, a large number of reports have accumulated on the harmful effects of these drugs. In some cases, their continued use has led to disturbances in liver, jaundice and also damage to brain cells

leading to tremors and affecting the movements of the hands. They have caused increased secretion of hydrochloric acid in the stomach which led to the formation of ulcers, nasal stuffiness, skin rash, obesity and other endocrinal disorders have also occurred. And strangely enough, in some cases, these drugs have caused just the reverse of expected effects, i.e., they caused maniac excitement, or deep depression and melancholy.

Over-reacting Patients

A certain amount of mental tension and anxiety is a part of our living. An examination, an interview, delivering a speech, even routine domestic and professional work generate a certain amount of mental stress.

The personality and physical make-up of some people is such that they over-react to these situations and for more prolonged periods than is warranted. In fact, they even invent one or the other reason to remain perpetually under mental stress.

Physician's Dilemma

In such patients, when the doctor is too busy in his private clinic or out-patient department, he may prescribe any one of the innumerable tranquillizers. When he has time on his hands, he may listen to the patient sympathetically and try to convince him out of his troubles.

Those of the physicians who wish to give their patients a quick proof of their learning, prescribe tranquillizers. And, mind you, there are many patients who prefer this line of treatment, or even expect it. Such physicians, and subsequently their patients also, feel convinced of the efficiency of these drugs, as they

are indoctrinated day in and day out by the powerful propaganda pamphleteering of the interested pharmaceutical companies.

In the opinion of most of the physicians, the use of tranquillizers in individuals with anxiety should be limited to a few doses, for not more than two or three days, in conditions which are transient, such as the reaction of grief following the death of an important person in the patient's life. The patient should not be brought totally under the influence of the tranquillizers as passing through and enduring the grief will prevent, in many instances, the development of long-lasting depressive reactions. It is better to help him achieve an adaptation to bereavement or other source of tension with a sympathetic ear and encouragement.

Long-term use of these drugs in cases of mental tension leads to the use of relatively large doses. The patient comes to depend upon chemical relief. If the drug is withdrawn, later on, serious symptoms are produced because of that.

At best, tranquillizers only lessen the emotional response to stress and anxiety by lessening the excitability of the hypothalamus, part of the brain, concerned with emotional behaviour.

Tranquillizers, however, have been of great use in different types of mental disorders such as schizophrenia, mania, delusion, hallucinations, etc. They are not the answer to tension, worry and anxiety. In these conditions, the answer lies in changing the habits that give rise to these disturbances.

28

TO BE LIKABLE

Everyone likes to be liked. If somebody says that he does not care whether people like him or not, I can assure you that he is hiding the truth. To be liked, to be appreciated, to be respected, is one of the deepest urges of mankind, as it is even of the animals.

Who are the people generally liked by others and what are their characteristics? These questions have been studied by social and behaviourist scientists and they have made some useful suggestions.

First, get keenly and genuinely interested in others. Get to know their interests, their hobbies, their difficulties, their likes and dislikes. Let people feel you are their well-wisher. Helping others will help you in the long run as when you think of others, they will think of you. One forgets one's own difficulties or grief after listening to and helping others.

When you are in somebody's company, make him feel comfortable. Show deep interest in him so that he talks about his interests. Be a good listener. People who are reserved and unresponsive, may be respected or feared but are never loved.

Learn to appreciate good points in others and praise them for it. If something nice happens to another person, make it a point to congratulate him even if

you have to post a card in a hurry. Appreciation and praise for a well deserved effort can help the person get confidence in himself; he will then try to be what he thinks you expect of him. Teachers observe this very often. Even a mediocre child starts doing well if the teacher praises him and tells him that he is capable of doing better. This is often seen in patients as well; if a doctor tells a patient that he is looking better than before, the patient starts improving.

Avoid Criticism

Curb your habit of criticising others. Everybody has his own outlook on life, shaped by special conditions and environments which have brought him up. From infancy to childhood and adulthood, each one of us passes through different environments which condition our thoughts, goals and the method of achieving them. That is why each one acts and thinks differently. And it is good as well, otherwise all would be acting alike in a given situation and how dull the life would be.

People do say that they are broadminded about criticism, but in fact, hardly anyone is. If other people have different views let them have the liberty to differ. Do not expect that by criticising them, you can make them change their views. Even if with your sound knowledge, you know that the other person is ignorant or wrong, do not make him swallow his errors. Maybe, you think, the other person has some fault in his character, personality or thought process, but who has not? Wise are those who ignore others' faults and try to pinpoint and eradicate their own.

Do Not Show Off

Do not try to show off yourself. In case you do show

off your riches or your culture or manners, it may be tolerated by some. But if you try to show off your intelligence or cleverness, it would be tolerated by none whosoever. There is nobody, rich or poor, who thinks that he is less intelligent than another person. People may grant you your riches— in fact, they generally overestimate other's riches—but so far as their intelligence is concerned, they never put anyone before them.

When you want to illustrate some point, refrain from giving your own example; other people may feel that you are showing off. If you are indeed clever, do not hurt others with your cleverness. Some so called clever men in the process of showing off their vast knowledge deflate others. If you hurt somebody's ego, he would leave no stones unturned to return the compliment at one time or another.

People have a curious habit. Those who want to tell others that they are superior, people join hands to make them look inferior; but one who has some good points in his favour and does not show off, people go out of their way to spot him and put him in the limelight.

Show courtesy and consideration in your manners and speech with each and all without exception—be it a sweeper or your boss. And this not as a cover, but respect for others. Speak in low or moderate tone and try to avoid words or terms which are indicative of excessive emotionalism.

Be Yourself

Only he who knows himself can profit by the advice of Matthew Arnold:

"Resolve to be thyself: and know that he who finds himself, loses his misery."

Being yourself is most important. Do not try to imitate. How long can one imitate? If you want others to like you, you like them first; if you want to be respected, you respect people first. For this, you will have to think with your heart and feel for others with your heart. Always try to see things from the viewpoint of the other person; then you would understand him better.

In spite of your best efforts, there could be some who just would not like you. Who has not faced such a situation? If the prophets and saints could not enjoy such an unqualified reputation, who are we then? But there is always a chance that you may ultimately succeed in converting the other person.

29

SURVIVING FAILURE

Two friends were discussing their husbands. One of them said, "My husband is very lucky. Ten years ago, he wanted to become a section officer from an assistant. He succeeded in the first attempt."

The other friend said, "My husband is not that lucky. He fails more often than he succeeds."

The first friend added, "I can hardly believe it. Your husband is a joint secretary in the ministry at such a young age, and yet you say that he succeeds only rarely."

The second friend explained, "He may succeed only once in ten times, yet he tries so many times and in so many directions that in spite of a large number of his failures, his number of successes is also large. He never stops trying. While I feel upset when he fails in spite of his best efforts, yet to him it does not mean much. He does not feel dejected at all. He analyses his failure, and the next time tries to make up in the direction in which his efforts were weaker the previous time."

To many, a failure acts as a break; to some, it acts as a spur. It is only the latter who go far, far ahead of the others.

It is rightly said that only they fall who try to climb and it is among them that some ultimately reach the top.

because they continue climbing. Those who are afraid of falling, naturally remain at the bottom.

How to Succeed

Various people who have succeeded in life have made a few suggestions in this regard.

According to them, it is necessary to have a clear view of what you want to get or what you want to become, as without that one is likely to continue drifting. Once that has been decided, then you can plan the ways and means of achieving your objective. Make it a habit to persevere in your efforts in spite of the failures or hurdles. More often than not, what seems to be a streak of luck in another person, turns out to be a streak of perseverance when you look at it closely.

Try to love the efforts you have to put in to succeed. Put your soul in the efforts. The effort made in such a way is a source of joy in itself. Many successful people say that they enjoyed their efforts more than the actual success.

Try to achieve perfection in your efforts. Go on toiling and sweating till the end-product cannot be improved upon. There are many who can do the work well, but there are only a few who do not feel satisfied till perfection has been achieved. It takes much longer and much more pains to achieve perfection than to merely do well. But then, it is worth all the efforts. It is this that makes a piece of sculpture or a painting a classic which brings success and fame.

Have on your hands all the information that is already available on the subject. Then try to tackle the problem in a different way from what others have been trying before. Do not follow the beaten path. Make a

fresh path, it may provide a better view or may be it is the path by which you attain success.

Do not predict to you trouble while starting a new venture. You are likely to come across what you predict: failure or success. It is not necessary that all the difficulties along a given path may be visible at the time of start, some may appear as you proceed. But difficulties also have the habit of appearing big from a distance. When you reach there, you find that they diminish in size and present no big obstacle. Have confidence and get going.

There are some who have some obvious handicap in a particular venture. For example, out of two students in a class, one may be very rich and the other very poor. The rich may depend on his influential relations to get him a good job. The poor one can do either of the two things: he may take his poverty as a handicap, brood over it and curse everybody, or he may resolve that in his situation, only persistent efforts and hard work could help him. It may take him longer to succeed but in the process he would develop confidence in his own efforts. Ultimately, he stands a better chance of reaching the top than the boy who had the advantage of his riches to begin with.

While you are trying to succeed, do not put hurdles or obstacles in the path of others. On the contrary, help them to succeed. When you extend help, you will get help in return. If you put obstacles in the path of others, others would do the same for you.

Whether one succeeds or fails, depends to a large extent upon the whole mental attitude of the person. Those who remember earlier painful memories of failure each time they try a new venture, have a greater tendency to fail. Those who keep in view the previous suc-

cessful achievements and the way they achieved them, improve their chances of success. The latter attitude of mind, subconsciously leads them to plan their present mode of action.

If you are ambitious and want to go far ahead, you are bound to come across failures. The response to a failure or defeat should not be dejection or disappointment, but to try once again.

30

PRAYER AND FAITH

Can prayer or faith in God help in lowering mental tension? I know of a person, Mr. L, who used to say, 'Only feeble-minded people go in for these types of gimmicks. Man should decide what he wants, work for it hard and perseveringly, and that is all there is to it. One can very well do without prayer to God. The time spent in prayer should profitably be applied to the work itself.'

Mr L was an engineer. He was employed in an India-based foreign firm. He drew a handsome salary, had a company's car at his disposal, his two children went to the best public school and his wife always talked of diamond jewellery. He was a hard and meticulous worker and was an asset to his company. However, the policy of the Government changed; the firm was asked to wind up its business in India and quit. This left Mr. L without a job for about a year. He thought of starting his own business, had two more partners and started work. No sooner the factory went into production, a riot broke out in the area, the factory was burnt down and Mr L had nothing left with him except a debt of over fifty thousand rupees to repay.

At this moment, poor Mr. L lost all confidence in himself, in his skill and his capacity to work hard. He

had nothing left in the world to lean upon. He did not come out of his house for weeks together. From a gay and happy person, he turned into a morose and lifeless fellow. The whole family was in a chaos, not knowing what to do.

Mr. L had an uncle living with him. He was the only person on whom this terrible loss in the family had no visible effect. He lived in a room on the upper floor of the house and spent much of his time in prayer, *kirtans* or just playing with children. In a corner of his room, he had decoratingly placed pictures and figurines of gods before whom he prayed with devotion.

As Mr. L had nothing to do now and also would not like to go out, he would occasionally go upstairs and sit there on the terrace. He noticed his uncle doing prayer with such devotion as he himself had had to his work. On asking his uncle, as to why he did the prayer, the latter replied that he derived peace of mind from it. Mr. L started doing the same and sometimes he liked the views of his uncle who would say, 'I am now seventy. I have seen many ups and downs in life. There was a time when my whole family, wife and four children, were killed in the Partition riots. Then I had thought that, that was the end of the world for me. But then, how could I sit idle and brood over my loss? I started working again. In this way, I no longer remained a burden on others and I got busy in the work. I felt less of my loss.' He would further say, 'Man is sometimes powerless before the circumstances. He thinks too much of himself but before the Will of God, he is nothing. An endeavour which he undertakes for profit, may turn out to be a loss. All that man can do is to put in his best efforts in the work which he undertakes. Whether he succeeds in it or not, he must leave to the Will of God. It is only when he starts expecting results of his

efforts that he gets disappointed and dejected when these fall short of his expectations. In the *Gita* also, Lord Krishna told Arjuna, "All you have to do is to act, leave the fruit of it to Me".'

The prayer and words of his old uncle had effect upon Mr. L. His uncle had some money with him which he gladly gave to Mr. L telling him that it would not find a better purpose at any other time. He went into business again, sagaciously, humbly. Gradually, his days changed, he prospered again. Now he depended first upon the Will of God and then upon his own capacity to work.

Faith in God may not get you what you want, but who knows that what you do not get, is not worth getting! How many times do we not curse ourselves and others that we did not get a particular thing; and after a while thank God that we did not get it.

Faith and Prayer

Many people pray to God only when they get into a calamity, just as they remember fire brigade when the house is on fire. That is not, in fact, a prayer. The habit of prayer over a period of time gives us confidence that God is with us; He is leading us on the right path and that we have His protection. It is this confidence—which we develop as a conditioned reflex—and it is this fact that helps us through difficult times.

Faith is known to have miraculous powers. It is through faith that some tribal people walk over burning charcoal without having anything like a blister under their feet. It is this faith that is said to dissolve away even cancerous masses. It is this faith that cures many a village or tribal man when a few incantations

are uttered over them by the *ojha*, the indigenous medical practitioner.

Faith in God and the habit of prayer seems to have gone out of fashion among educated people, but it has a positive role in human welfare. Simple prayer, singing of *bhajans* and *kirtans*, provide peace of mind and solace. Prayer is most effective when it does not ask for anything but is intended as a gesture of thanks giving for all that God has given us.

31

ROLE OF PSYCHIATRY

Mr. M was a big businessman. He was the owner of a large cloth mill. He was a philanthropist also, and a member or head of a large number of public welfare organisations. He was a good conversationalist and a jovial company.

Mr. M had a handicap which embarrassed him greatly. As soon as he was asked to give a public speech at some function, he would perspire, his heart would start thumping in his chest. All he could utter was a few stuttering words and then he would sit down exhausted having spoilt his mood.

One of the doctor friends advised him to see a psychiatrist. This was arranged. After a few meetings with the psychiatrist, it turned out that even as a student in the college and the school, he had similar affliction. He could sing well to himself, he could stand up and answer the questions asked by the teacher, but if he was asked to recite a poem in public, he would feel nervous. In fact, just after he had joined school, once in such a situation, he vomited and lost consciousness.

Probing into his childhood, it was revealed by his mother that when he was three years old, his birthday was celebrated with a lot of pomp and show and it was a grand function. When most of the guests had left, his

father asked the child to sing a song in front of some near relations and intimate friends. The child got nervous before people who to him were strangers. His father insisted that he should sing, and when he could not, the former rebuked him and slapped him before everybody present. He started crying, vomited out all that he had taken and had fever for the next four days. It was since then that he could not sing or speak before a formal audience.

Digging into his past brought out an event which the person himself had forgotten but his subconscious mind could not. When the cause was revealed, a few more sittings with the psychiatrist encouraging him gradually to sing or make a speech, first before the psychiatrist and then before friends emboldened him and reassured him of his capacity to make a speech anywhere.

It is well established that the mere fact of knowing what hurts you, has an inherent curative value. Psychoanalysis has demonstrated the soundness of this principle perhaps better than any other branch of medicine. The psychoanalyst helps you to understand how previous experience—which may have led to subconscious conflicts, sometimes very early in childhood—can continue almost indefinitely to cause mental or even physical disease. But once you realize the mechanism of your mental conflicts, they cease to bother you.

Childhood Experiences

Particular experiences of childhood, which have been highly charged with emotion but later repressed, may be the cause of specific phobias or tensions. These causes seem to operate principally along the line of reconditioning.

It was Sigmund Freud whose researches laid the foundations of psychiatry, a branch of medical science which studies the mind and treats mental disease.

The original observation from which Freud started his lifelong research is the treatment of a hysterical patient by means of hypnosis. During the hypnotic session, the patient relived an incident in her remote past, till then forgotten. In reliving the incident, she showed the most lively emotions, and after it experienced substantial relief from her symptoms.

Freud's reflections on this patient led him directly to the conception of the unconscious, to the concept of repression, and to the view the emotions attached to repressed memories could affect the individual's responses to events of the present.

Psychiatry can help reveal to the person the cause of his mental tension and anxiety. It can help a person attain new insights into his mind and emotions. Once the cause is known, measures can be taken to get rid of that.

Psychiatry treats mental stress by trying to bring the conflicts from the unconscious into the conscious mind so that they can become accessible and thus be resolved. As a rule, psychiatrists do not use drugs and if they do, it is only to facilitate communication with the patient.

Psychiatry and psycho-analysis, however, are not needed in the majority of the cases of tension and anxiety as the factors behind the condition can easily be found out and appropriately treated. Psychiatry is best reserved for those cases which are grave and chronic, also those which involve a personality sufficiently endowed with intelligence and possibilities of insight to be likely to profit by it. It offers the advantage of

giving the patient a chance to unburden himself of all his worries and to discharge his tension in talking to a sympathetic listener. In going over the same ground again and again, it is quite likely that environmental causes of tension and worry will appear, of which the patient is hardly aware; he may then be guided to put them right.

32

EPILOGUE

Great advances in medicine in the last hundred years, particularly those of the discovery of different bacteria as the cause of various diseases, and the antibiotics to kill those germs in the body, have lessened death and disease. As a result the average human life span has increased all over the world and in India as well. There are now more and more people who reach old age.

Older people as well as some of the younger ones, are now being seen to suffer from the diseases of wear and tear of the body. The more the stress and tension they undergo in life, the more they suffer from or die from these diseases.

Human life span can be increased further and the old age made more comfortable if we can lessen wear and tear of the body.

Some wear and tear is unavoidable because of our daily exposure to all sorts of stimuli; but much of it is surely avoidable if we make use of our senses properly. An example quoted below makes the point clear. If you happen to meet a helpless drunk who showers you with insults, but is obviously quite unable to do you any harm, nothing happens if you go past and ignore him. However, if you respond by fighting or even only

preparing to fight, the consequences may be tragic. You discharge adrenalines that increase blood pressure and pulse rate, while your whole nervous system becomes alarmed and tense in anticipation of combat.

Such incidences occur frequently in everybody's life and these can and should be avoided, because the wear and tear they lead to serves no purpose.

In a scientific-cum-philosophical mood, Hans Selye lays down the following recommendations for our day-to-day living in modern tumultous times.

1. "*Find your own natural stress level and run toward what you accept as your own goal.* People differ with regard to the amount and kind of work they consider worth doing to meet the exigencies of daily life and to assure their further security and happiness. In this respect, all of us are influenced by hereditary predispositions and the traditions of our society. Only through planned self-analysis can we establish what we really want. Granted, this is difficult and takes much time, but too many people suffer all their lives because they are too conservative to risk a radical change and break with tradition.

2. *Practise altruistic egoism.* The selfish hoarding of the goodwill, respect, esteem, support and love of our neighbour is the most efficient way to give vent to our pent up energy while creating enjoyable, beautiful or useful things.

3. *Earn thy neighbour's love.* The motto, unlike the command to love, is compatible with man's natural structure, and, although it is based on altruistic egoism, it could hardly be attacked as unethical. Who would blame anyone who wants to assure his own homeostasis and happiness by accumulating the treasure of other peoples' benevolence and gratitude towards him? This

gives him self-esteem and at the same time makes him quite safe, for nobody wants to attack and destroy those upon whom he depends.

Man is a social being. If you have earned your neighbour's love, you will never be alone, and he who desires safety must avoid remaining alone in the midst of our overcrowded society. You must try to trust at least some people, despite their apparent untrustworthiness, or you will have no friends, no support.

These three main principles are derived from observations on the basic mechanism that maintain homeostasis in cells, organs, people and entire societies, and that help them to face the stressors encountered in their constant fight for survival, security and happiness. In some people they have developed naturally during evolution, without the need for scientific proof. But evolution has not yet reached its final completion; it is still in progress. Meanwhile, we can best use these guidelines by conscious understanding and voluntary control."

By following the above principles—and these are all practicable—we not only can help ourselves but also the society in which we live.

33

STRESS ASSESSMENT TEST*

To help the reader assess himself about stress, the following test is framed.

Group I. Factors not within the Control of Individual

1. PARENTS' LONGEVITY

0. Both parents 75 or more at death.
1. Both parents 60-74.
2. One parent 75 or more, one < 60.
3. One parent 60-74; one < 60.
4. Both parents < 60.

2. SEX

1. Female
2. Spinster
3. Male
4. Widowed male

3. AGE

0. 1-12, (childhood)
1. 21-34 (getting established)
2. 50-64 (time of maturity)
3. 13-20 (the trying teens); 34-42 (the middle crisis)
4. 65 and over, senior citizen

Group II: Factors Partially within Control of Individual

4. PERSONALITY TYPES

0. Relaxed life style
1. Negativistic
2. Passive-dependent; non-competitive
3. Obssessive-compulsive
4. Aggressive

5. STRESS-RELATED DISEASES (hypertension, peptic ulcer, coronary heart disease, brain stroke).

0. Individual and parent had none of the diseases
1. Individual had none; parent (s) had one
2. Individual and parent (s) had at least one
3. Individual had at least one; parent (s) had two or more
4. Individual had at least two; parent (s) had two or more

6. MISHAPS OR ACCIDENTS

0. None in the past ten years
1. One
2. Two
3. Three or four
4. Five or more; accident-prone

7. BODY WEIGHT

0. 1-5 lbs below standard weight-height
1. +or -5 lbs from standard
2. 6-15 lb above standard
3. 16-27 lbs above standard; 6-25 lb below standard
4. 30 lb or more above standard

8. RELIGIOUS ATTITUDE

0. Devout; belief in personal God or fate.
1. Regularly attends services
2. Does not give much attention to religion
3. Does not believe in religion
4. Does not believe in God

9. LIFE-CHANGE EVENTS

0. None within the last year
1. One 'moderate' within the last year (e.g., change in residence)
2. Two 'moderate'
3. One 'severe' (e.g., death of a beloved one), three or more 'moderate'
4. Two or more 'severe'

10. FINANCIAL STATUS

0. Upper (monthly income over Rs. 5000)
1. Upper-middle (monthly income about Rs. 3000)
2. Middle-middle (monthly income about Rs. 2000)
3. Lower-middle (monthly income about Rs. 1000)
4. Lower (monthly income Rs. 500 or less)

11. OCCUPATION

0. Independently wealthy; free to engage in diversions
1. Scientist, actor, entertainer, artist, model
2. Teacher, athlete, writer, white-collor worker, salesman
3. Physician, dentist, lawyer, business executive, blue-collar worker
4. Policeman, fireman; accountant, stuntman, pilot, gambler, criminal, prisoner, unemployed.

12. LOCATION

0. Business and home, rural; student, rural

1. Business and home, suburbs; student, suburbs
2. Business, large city; home, suburb
3. Business and home, small city
4. Business and home, large city

13. MARITAL STATUS

0. Happily married; single (age 20 or less)
1. Happily married; second marriage
2. Tolerable marriage
3. Single (never married), divorced, widowed
4. Twice divorced and/or widowed

14. CHRONIC STRESSORS: ANXIETY, FRUSTRATION, WORRY, NOISE.

0. None as far as is known
1. Occasional, slight to moderate
2. Occasional, severe
3. Regular, slight to moderate
4. Regular, severe

Group 3. Factors within Control of Individual

15. ALOCHOL

0. None; one glass of wine per day
1. One cocktail or two glasses of wine daily
2. Two cocktails or three glasses of wine daily
3. One-half bottle of whisky (or other hard liquors) daily
4. Alcoholic

16. COFFEE AND OTHER CAFFEINATED PRODUCTS

0. None at all
1. Occasional tea or cocoa
2. 1-2 cups of coffee daily; 3-4 cups of tea

3. 3-4 cups of coffee daily; 5-6 cups of tea
4. 5 or more cups of coffee daily; 7 or more of tea

17. DRUGS

0. None at any time
1. An occasional pill
2. Take pills a couple of times a week
3. Take pills several times a week
4. Take pills daily—"hooked"

18. SMOKING

0. None at all
1. On rare occasions
2. Less than a pack a day; regular pipe or cigar user
3. Upto 2 packs daily
4. Over 2 packs per day

19. EATING

0. Low fat, low sugar, low salt, no snacks, balanced diet
1. Little fat, low sugar, low salt, no snacks, balanced diet
2. Moderate fat, moderate sugar+salt, moderate snacks, balanced diet
3. Moderate fat, moderate sugar+salt, high snacks, unbalanced diet
4. High fat, high sugar+salt, high snacks, unbalanced diet

20. COMPANIONSHIP

0. Many friends and acquaintances
1. Many acquaintances, few friends
2. One friend, a few acquaintances
3. No friends, a few acquaintances
4. A "loner", no friends or acquaintances

21. CONSULTATIONS

0. Regularly with family, friends, professionally
1. A few times a week
2. One occasion; perhaps with a crisis
3. Rarely
4. Never

22. SLEEP

0. 8 hours per night; no problems
1. 7-7½ or 8-8½ including daytime naps
2. 6-6½ or 8½-9 including naps
3. Over 9 including naps
4. Less than 6 total

23. RELAXATION RESPONSE

0. Twice daily; meditation
1. Once a day
2. Once every other day
3. Once a week
4. Never, or more than 3 hours each day

24. DIVERSIONS

0. Daily, regular, diversions; periodic vacations
1. Daily, regular diversions; occasional vacations
2. Occasional diversions; vacations rare
3. Diversions rare; no vacations
4. No diversions or vacations

25. EXERCISE

0. Regular exercise and games
1. Regular exercise, no games
2. Occasional exercise or games
3. Rare exercise or games
4. Never

26. POSITIVE PSYCHOLOGICAL COPING, e.g., REASONABLE GOALS, EFFECTIVE ACTION, POSITIVE ATTITUDES

0. Regularly act constructively and effectively
1. Usually cope well
2. Occasionally cope well
3. Rarely cope well
4. Never seem to be able to cope well

27. CHEWING BETEL

0. Never
1. Occasionally
2. Betel leaves regularly, with tobacco occasionally
3. Betel with tobacco regularly
4. Betel with tobacco regularly and keep in the mouth at night

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Interpretation	
Excellent	1-19
Very good	20-34
Good	35-54
Average	55-74
Poor	75-89
Bad	90 and over.

If your score is average/poor/bad, you should seriously consider changing your life style. While you can't do anything about factors which fall in Group A, you can certainly do something about Group B & C.

Morse and Furst (1979)

Mental tension and its cure

Dr. O. P. Jaggi

M.D., Ph.D., F.C.C.P (USA) F.A.C.A (USA)

In the grab-and-push of daily life, mental tension has become as inevitable as the rush hour traffic jam. Though not a disease in itself, mental tension leads to a number of ailments, amongst them serious ones like heart attack, stomach ulcers, nervous break-down and even insanity.

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